



Using Earned Value to Course Correct and Deliver on Time

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Producer - Filament Games

GAME DEVELOPERS CONFERENCE®

MOSCONE CENTER · SAN FRANCISCO, CA

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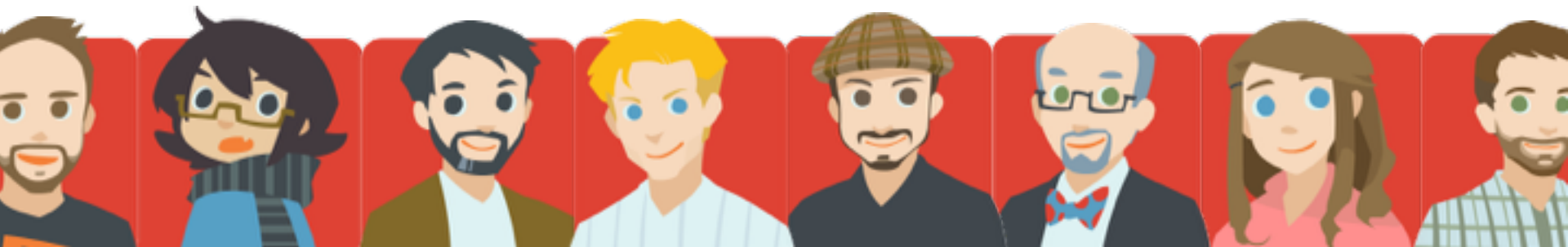


Overview

- Filament Structure
- Finding the Answer
- Earned Value Management
- Project Examples
- Making the Transition



FilamentGames™





Clients



VANDERBILT UNIVERSITY

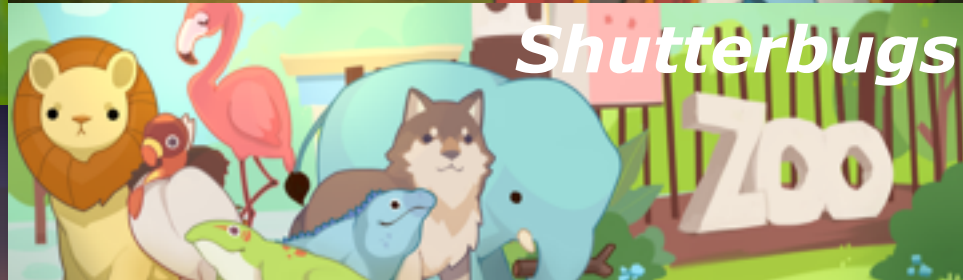


Smithsonian Institution



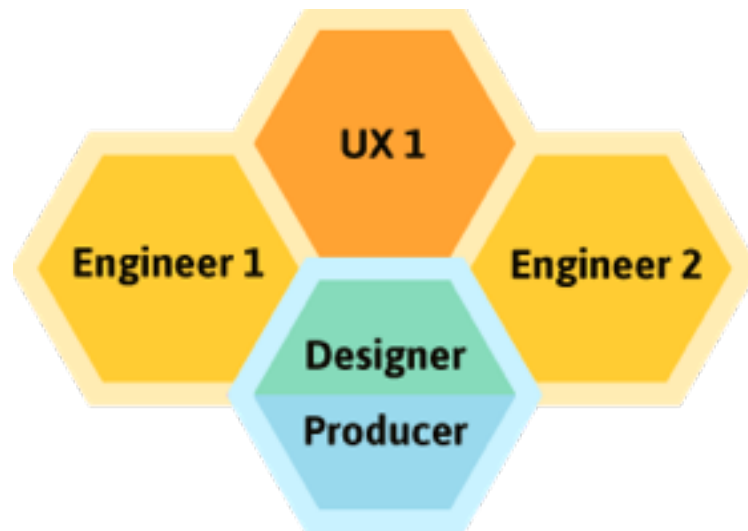


Projects



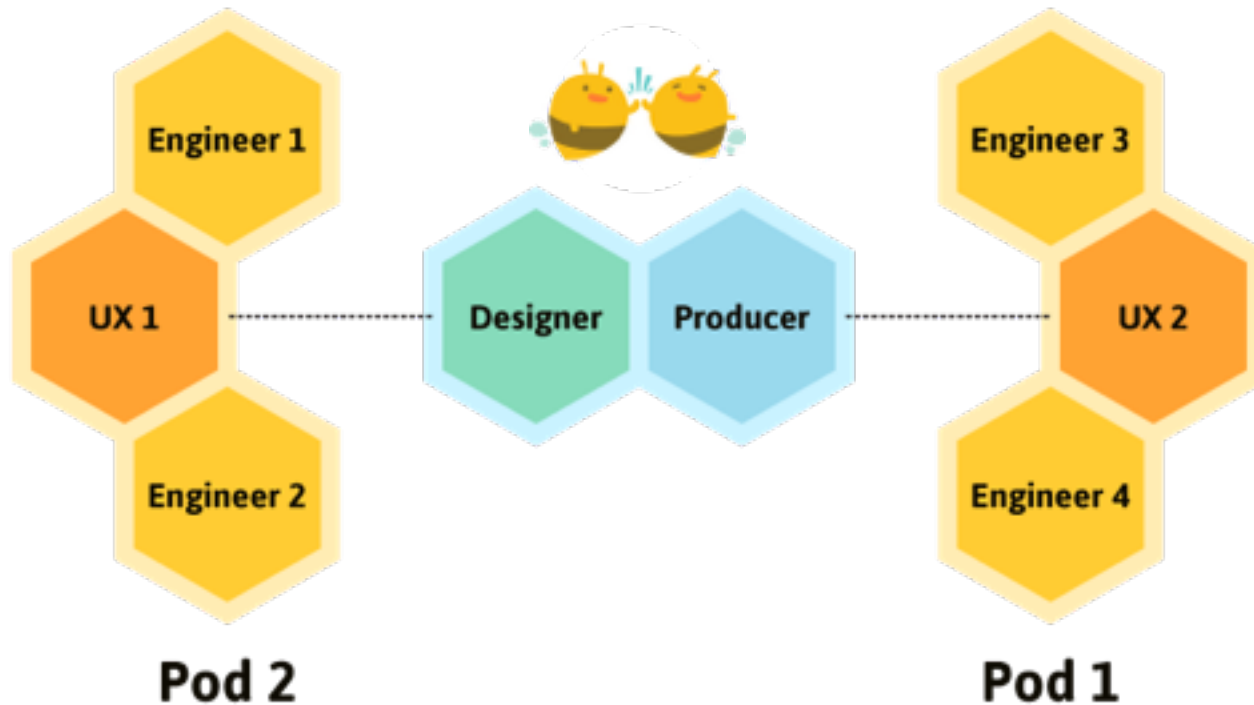


Pod View



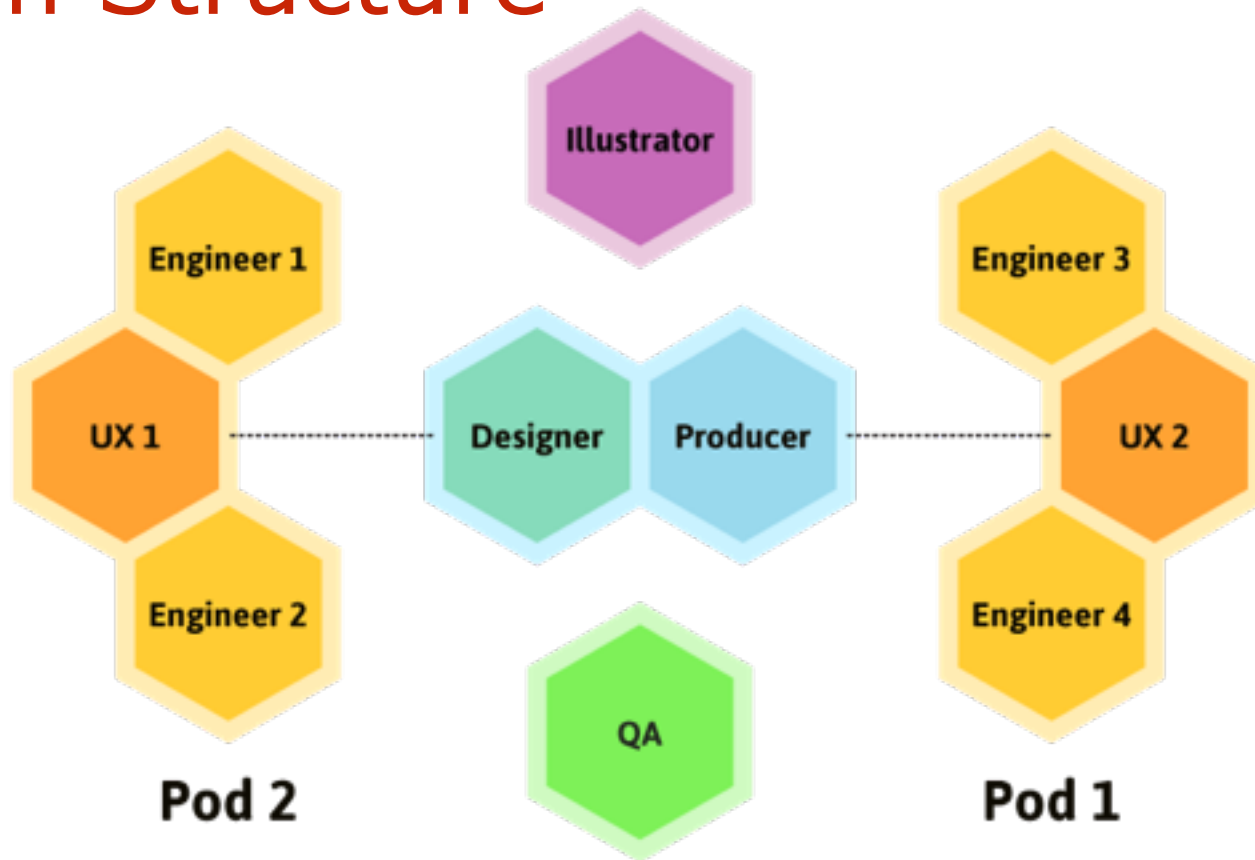


Team Structure





Team Structure





The Problem Child

- Original Game + Sequel
- Art budget 2-3x larger than other projects
- Unfamiliar Genre
- Trending 3-6 months late early on



How much



to finish?



Finding the Answer

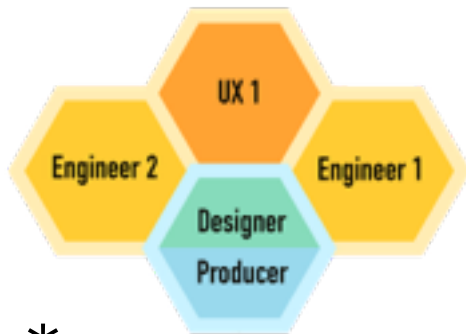


Project	% complete	Total Time in Months (anticipated end date) - (actual start date)	Avg % of pods allocated	Pod Allocation	Total Price of Contract	Total Projected Cost ((finish date - start date) * % of pods * top-down pod cost from budget template)	Planned Profit	Projected Margin (price- cost) / price for the project
	95%	9	0.75	0.75				-54%
	75%	2.47	0.5	0.5				32%
	75%	22.60	0.75	0.75				-184%
	???	16.13	1	1				12%
	???	#VALUE!	0.7	0.7				-136%
	99%	6.67	0.31	0.31				-13%
	105.96%	17.33	0.5	0.5				-58%





X% of



*

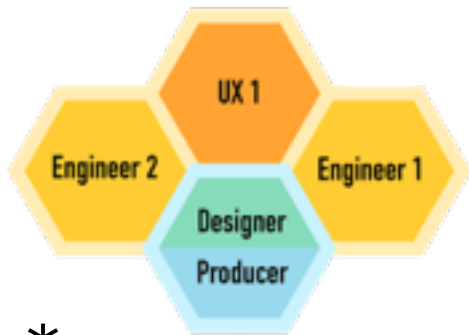
Project Length

*

Monthly Cost of Pod



X% of



*

Project Length

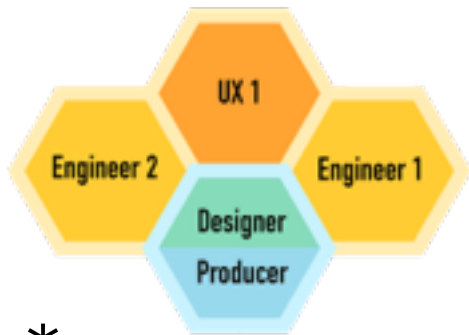
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~~Monthly Cost of Pod~~
Burn Rate

Number of Pods



X% of



*

Project Length

*

~~Monthly Cost of Pod~~

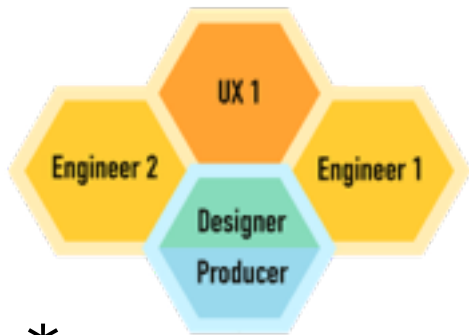
~~Burn Rate~~

(Development Team Salaries + Overhead Salaries + Benefits + Expenses)

Number of Pods



X% of



*

Project Length

*

~~Monthly Cost of Pod~~

~~Burn Rate~~

(Current Development Team Salaries + Overhead Salaries + Benefits + Expenses)

Number of Pods



Project	% complete	Total Time in Months (anticipated end date) - (actual start date)	Avg % of pods allocated	Pod Allocation	Total Price of Contract	Total Projected Cost ((finish date - start date) * % of pods * top-down pod cost from budget template)	Planned Profit	Projected Margin (price- cost) / price for the project
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	99%	6.67	0.31	0.31				-13%
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Project	May '12	Jun '12	Jul '12	Aug '12	Sep '12	Oct '12	Nov '12	Dec '12	Jan '13	Feb '13	Mar '13	Apr '13	May '13	Jun '13	Jul '13	Aug '13	Sep '13	Oct '13	Nov '13	Dec '13	Jan '14	Feb '14	Mar '14	Apr '14	May '14	Jun '14	Jul '14	Aug '14
					0	0	0	0.25	0.25	0.5	0.5	0.25																
							0	0	0.5	1	1	1	1	1	0	0.25	0.25	0.25										
												0.5	0.5	0.5	0.5	0.5	0.75	0.25										
	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25	0	0	0.5	0	0.25													
	0	0	0	0	1	1	1	1	1	1	0.5	0	0.5	0	0													
										0.25	0.5	0.5																
					0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5															
		0.5	0.5	1	0	0	0	0	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	0.25	0.25	0.15	0.15	0.15	0.15
														0.5	1	1	1	1	1	1	1	1						
													0.5				1	0.25										
																0.5	0.13											
													0	0.25														
													0.25	0.5	0.5	0.25												
														0.5		1	0.5											
																		0.5	0.5	0.25								
																			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25		
																				0.5	0.5	0.5	0.5	0.5	0.5	0.25		
																					0.13	0.5	0.5	0.25				
Studio Allocation	17%	25%	17%	25%	33%	33%	33%	38%	54%	75%	83%	79%	96%	88%	88%	86%	81%	67%	58%	50%	50%	50%	21%	21%	19%	15%	11%	11%

[illegible]



Finding the Solution

1. Financial view
 - Cost performance
2. Production oversight
 - Evaluating decisions





Earned Value Management



Earned Value Management

- Blend the following into one report:
 - Scope
 - Schedule
 - Cost
- Tries to provide objective framework for project management





History of Earned Value

- Developed in the 1960's by Department of Defense
- Used as a method of validating R&D progress
- Since then, now required for government contractors

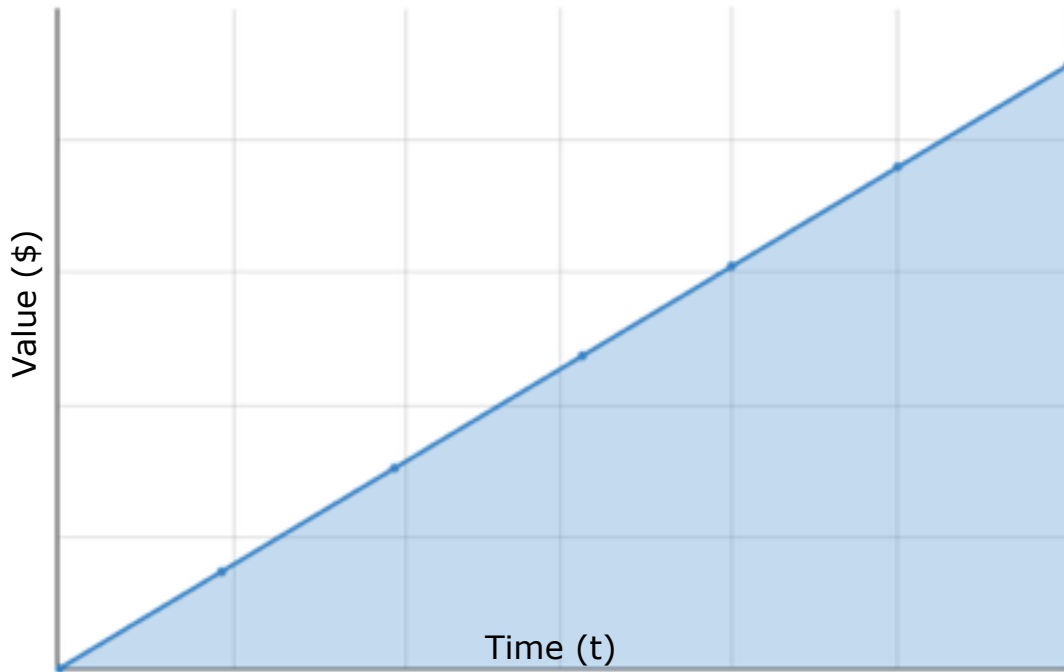


Concepts of EVM

- Common unit of measurement
- Work (scope) = Budget (cost)
- Equity is sum of all work done to date
- Cost and accumulation of equity should match original plan



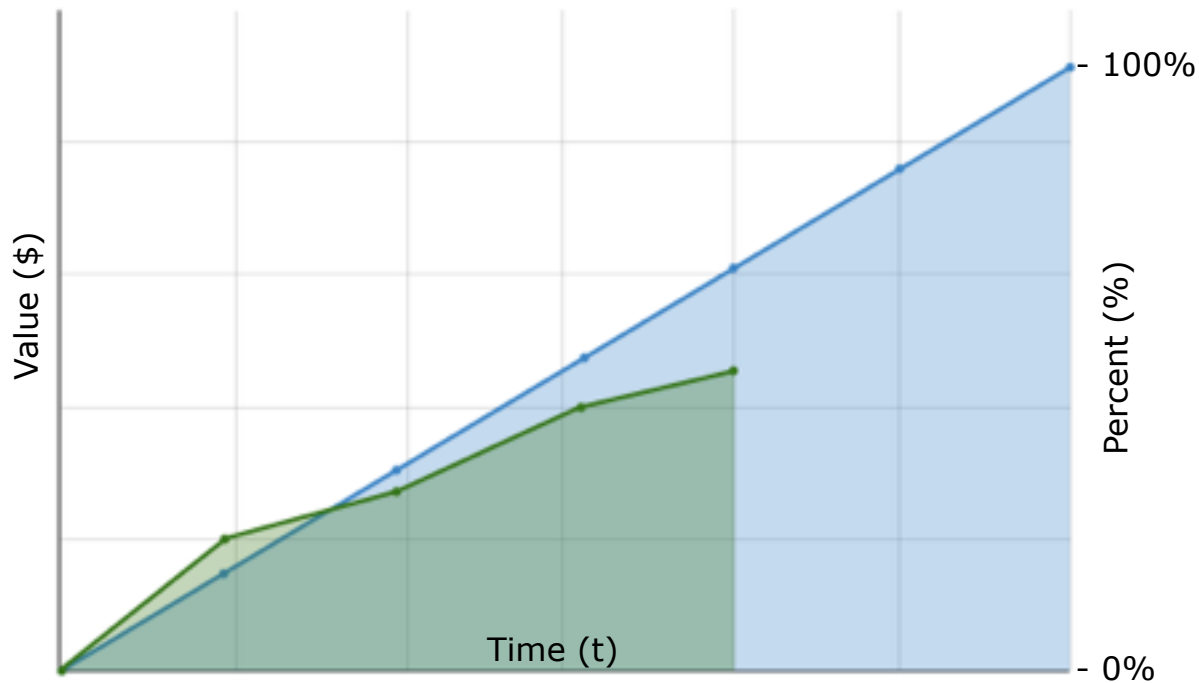
Planned Value



AKA: Budgeted Cost of Work Scheduled (BCWS)
Project Performance Baseline



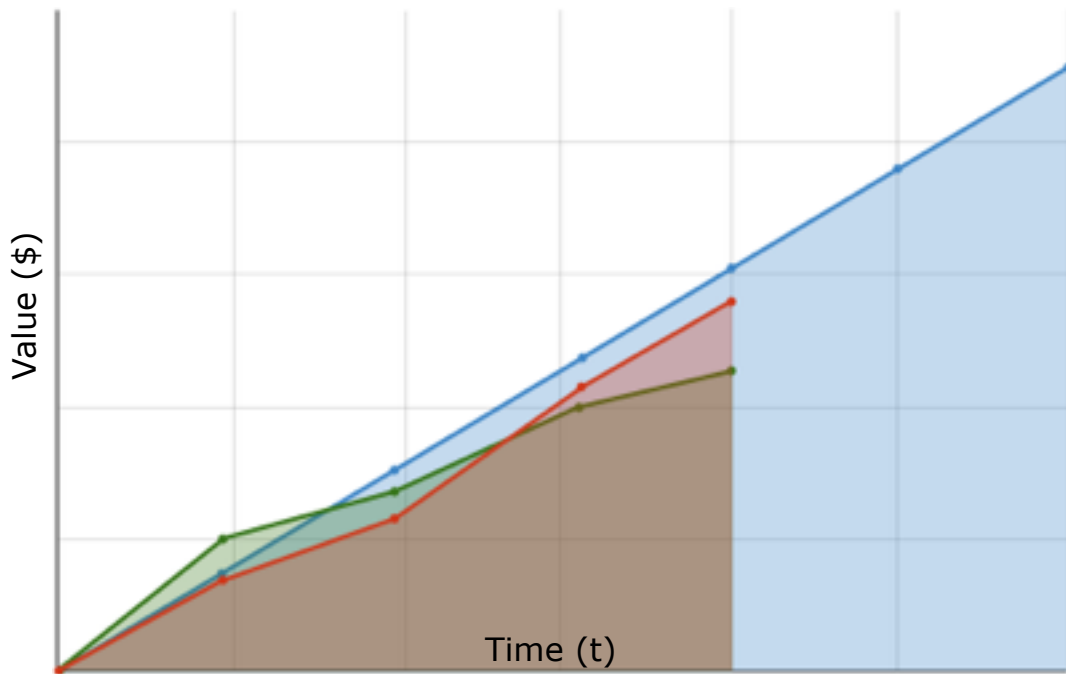
Earned Value



AKA: Budgeted Cost of Work Performed (BCWP)



Actual Cost



AKA: Actual Cost of Work Performed



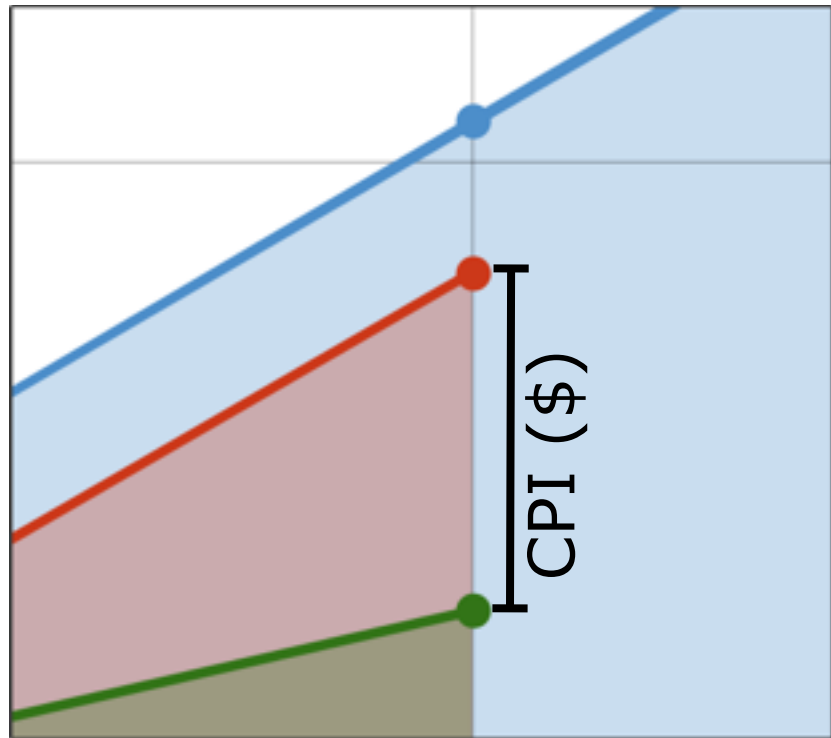
Cost Performance Index (\$)

Did the cost of adding equity = what was added?

$CPI = \text{Earned Value} / \text{Actual Cost}$

$CPI > 1$ is good

$CPI < 1$ is bad





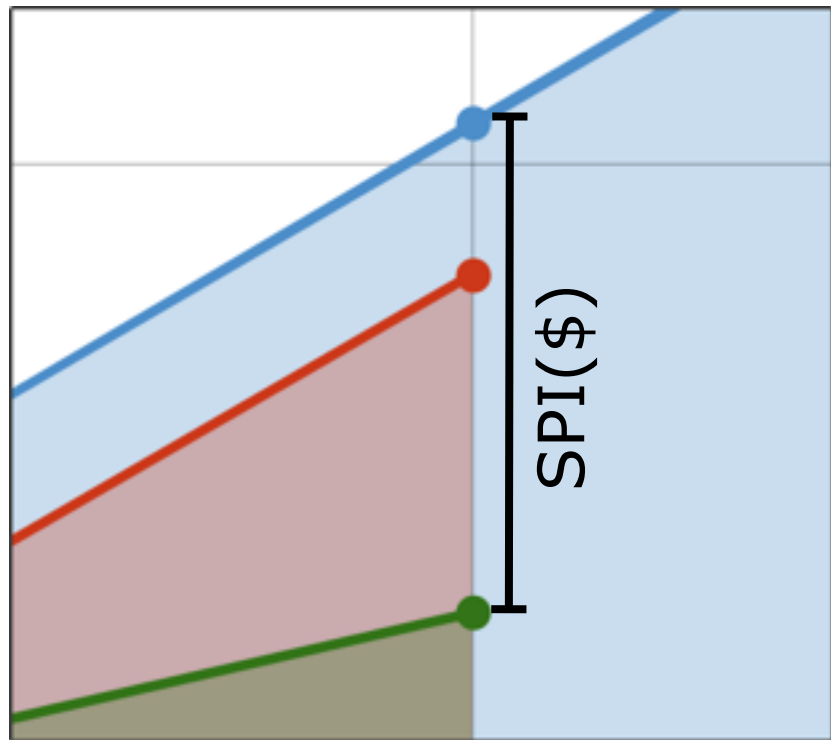
Schedule Performance Index (\$)

Does a day of schedule =
a day of progress?

$SPI(\$) = \text{Earned Value} / \text{Planned Value}$

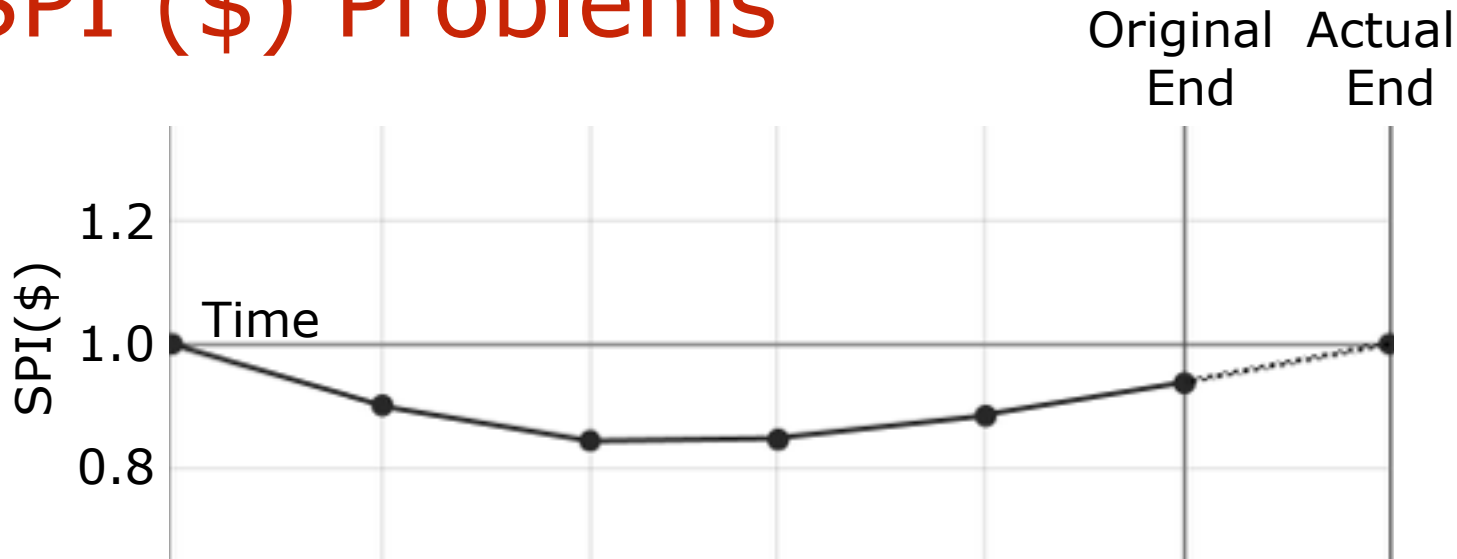
$SPI(\$) > 1$ is good

$SPI(\$) < 1$ is bad





SPI (\$)



- At end of project, earned value will always equal planned value.
- Improvement or false indicator?



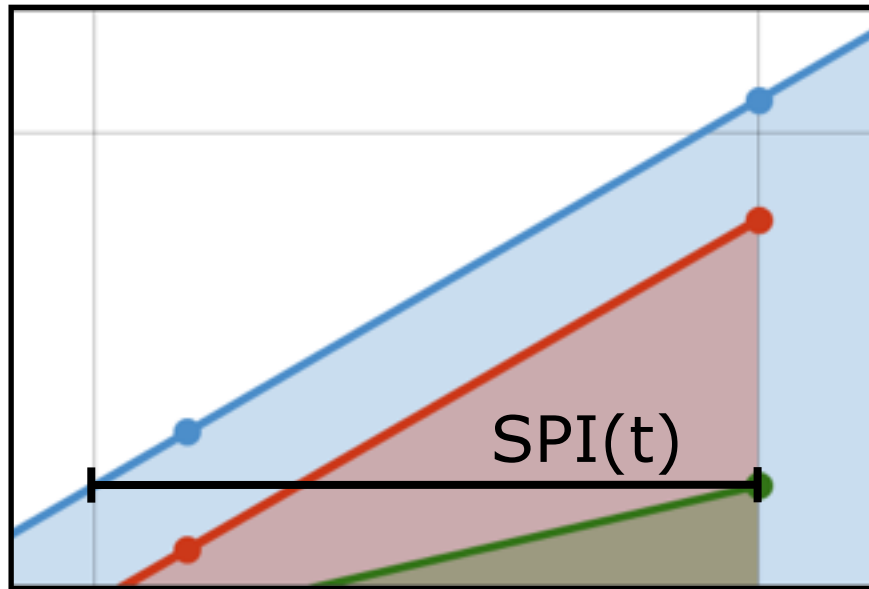
SPI - REDUX! (t)

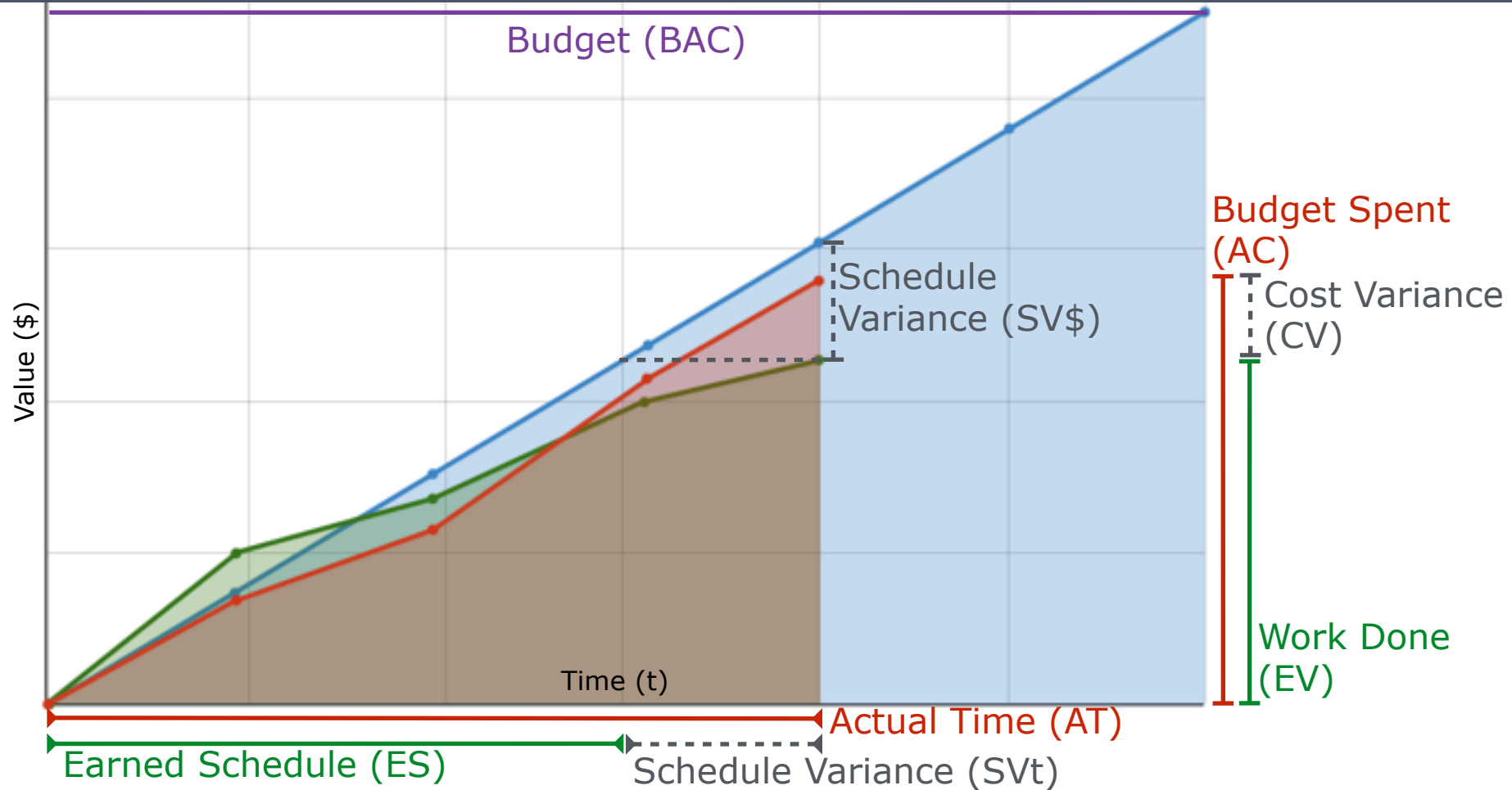
When did we plan to have this much equity?

$SPI(t) = \text{Earned Schedule} / \text{Actual Time}$

$SPI(t) > 1$ is good

$SPI(t) < 1$ is bad

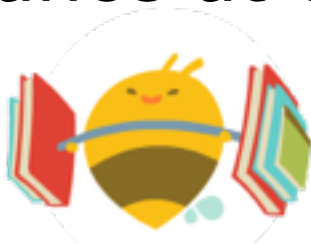






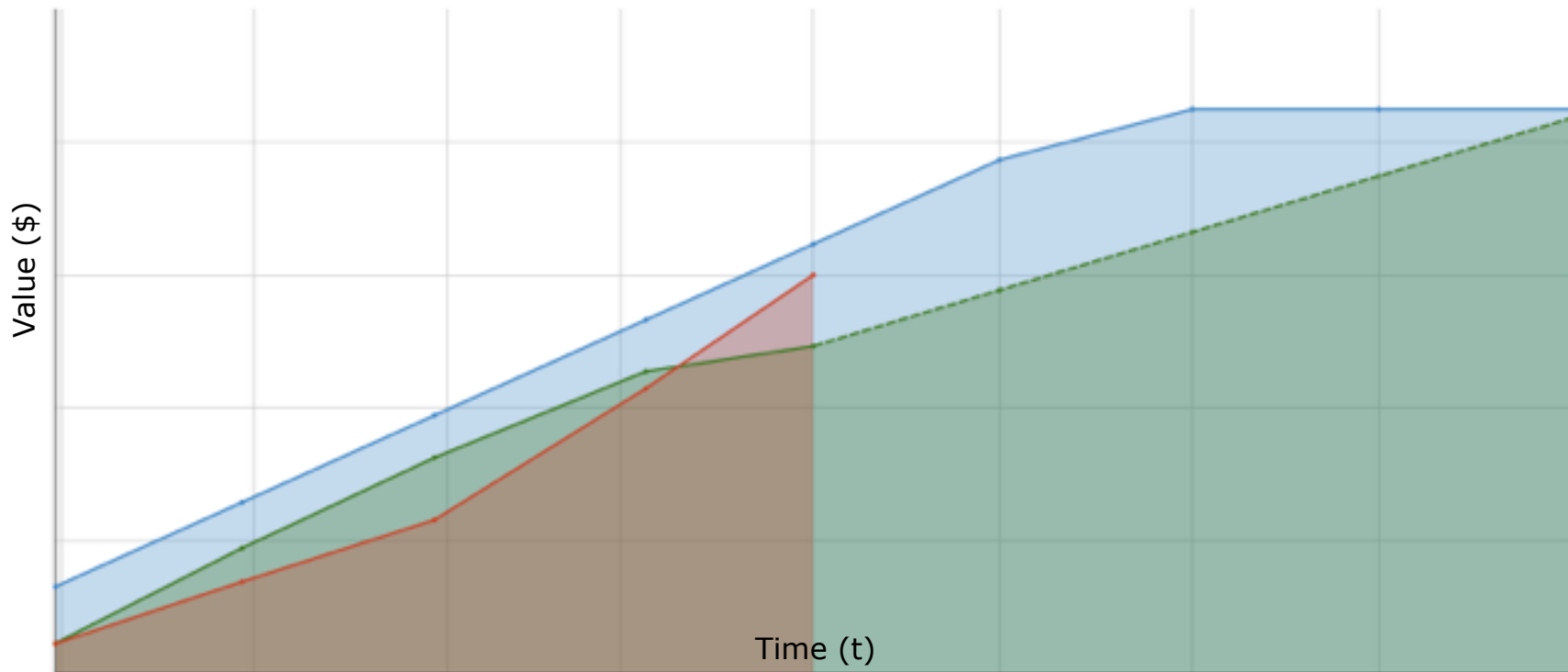
Estimating Completion

- Can assume past performance is indicator of future performance
- Two important estimates
 - Estimate At Complete (\$)
 - Estimated Completion Date (t)
- Can deduce variance at completion(\$ and t)





Estimating Completion



*Using average of $SPI(t)$



EVM Equation Reference

- AC = Actual Cost
 - Project cost to date
- PV = Planned Value
 - Expected gain of equity
- CPI = Cost Performance Index
 - Ratio of work done to costs
- SPI(\$) = Schedule Performance Index
 - Ratio of work done to work planned
- SPI (t) = Schedule Performance Index
 - Ratio of earned schedule to current date
- EV = Earned Value
 - Equity earned to date
- BAC = Budget at Complete
 - Planned project cost



EVM Equation Reference

- $CPI = EV / AC$
- $SPI(\$) = EV / PV$
- $SPI(t) = \text{Earned Schedule}(d) / \text{Actual Time}(d)$
- $EAC = BAC / CPI$
- $\text{Estimated Duration} = PD / SPI(t)$
- $ECD = \text{Start Date} + ED$
- $\text{Cost Variance} = EV - AC$
- $CV \text{ at Complete} = BAC - EAC$
- $\text{Schedule Variance}(\$) = EV - PV$
- $\text{Schedule Variance}(t) = ES - AT$
- $SV(t) \text{ at Complete} = ECD - PD$

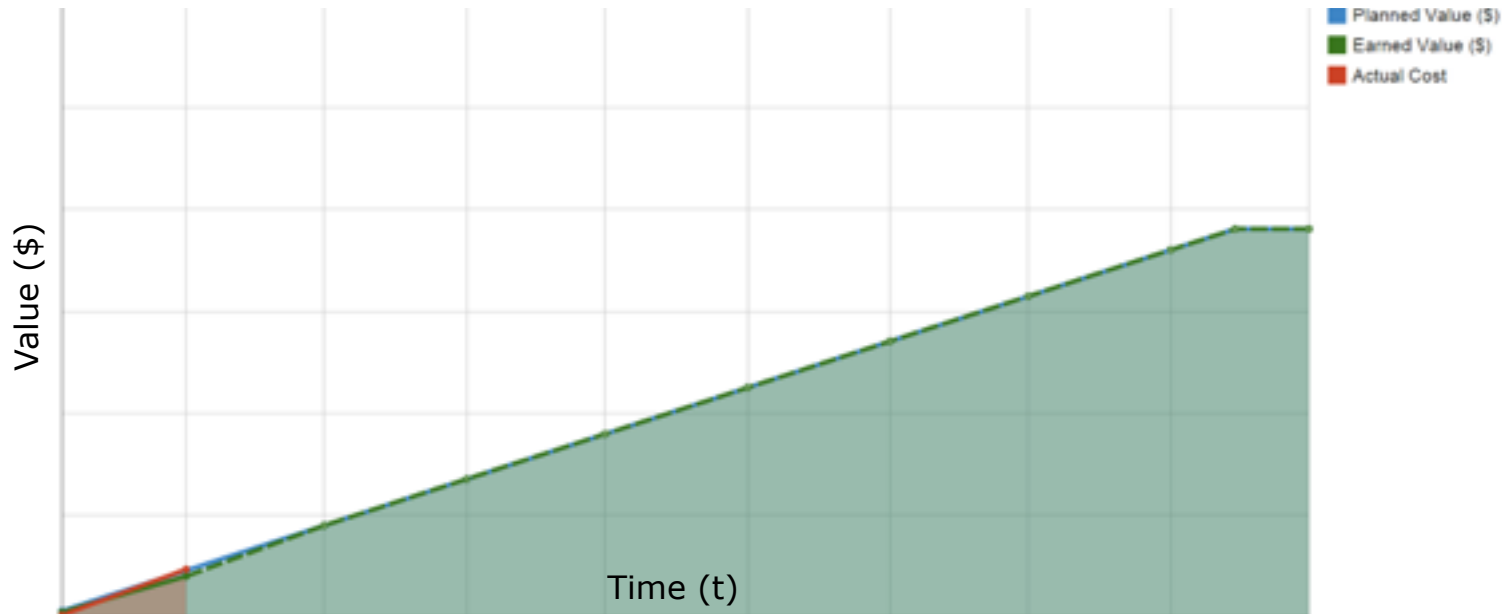


Project Examples





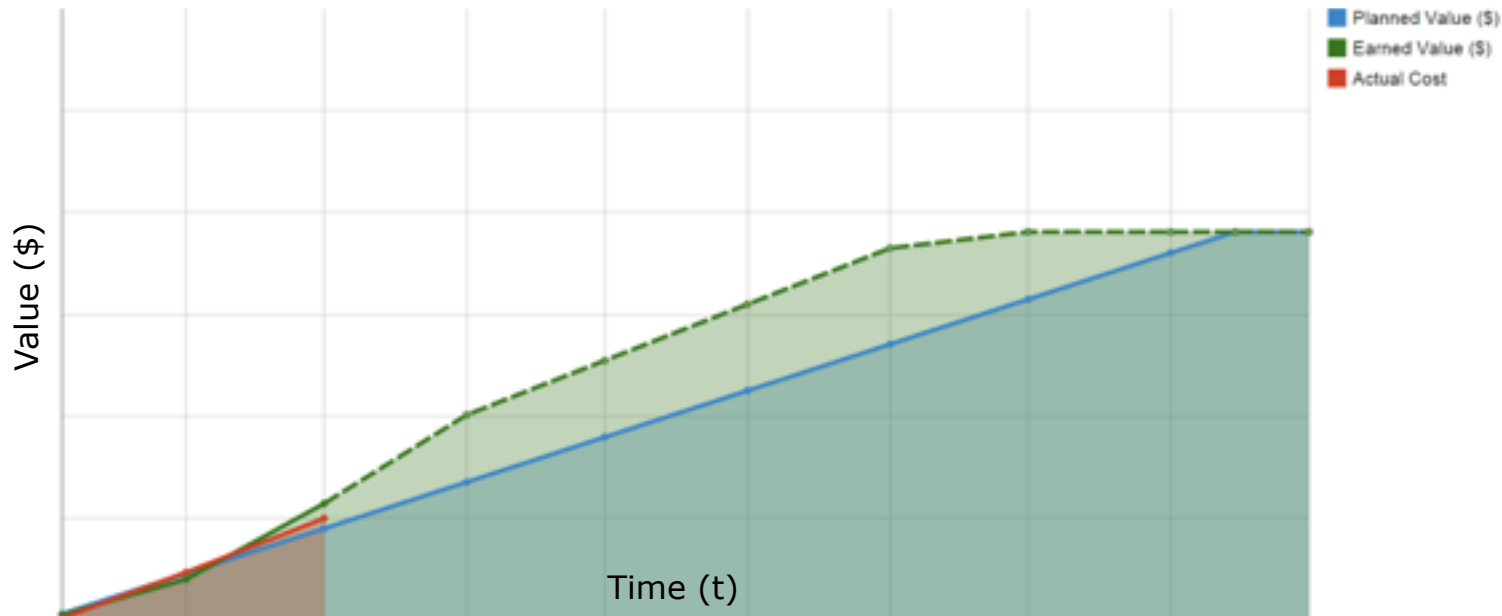
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85								
SPI(t)	1.0								



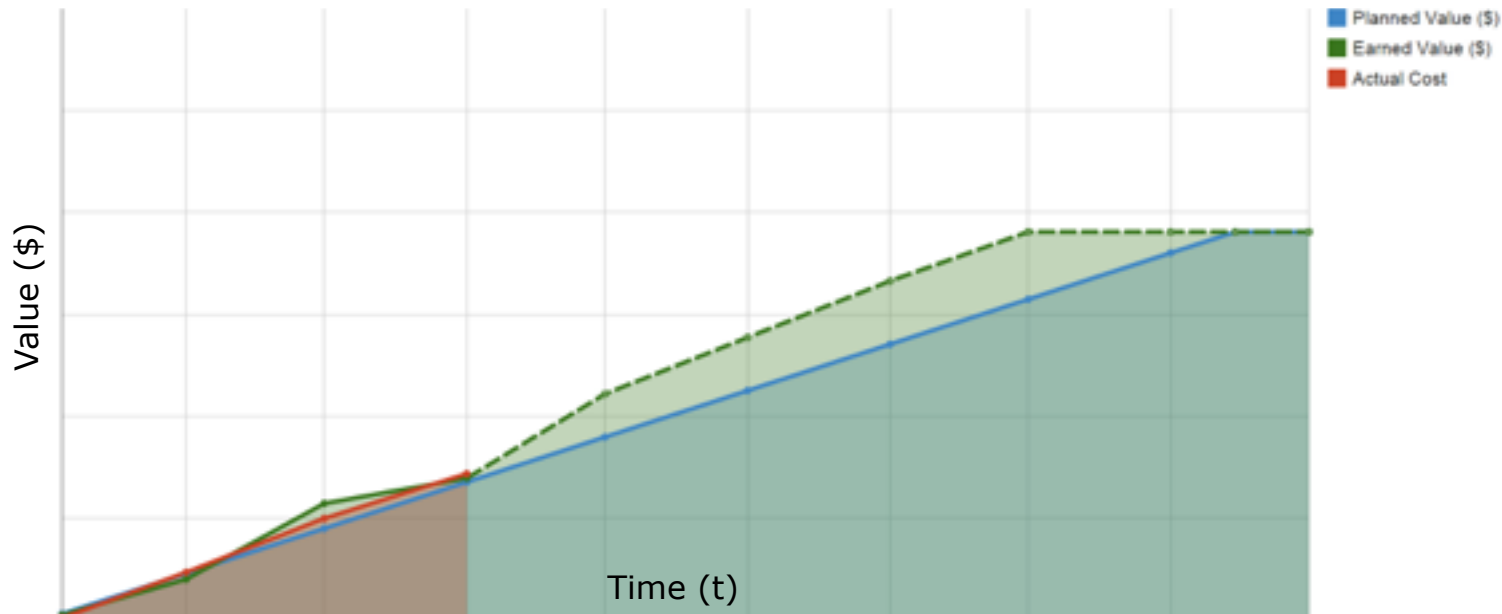
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85	1.15							
SPI(t)	1.0	1.27							



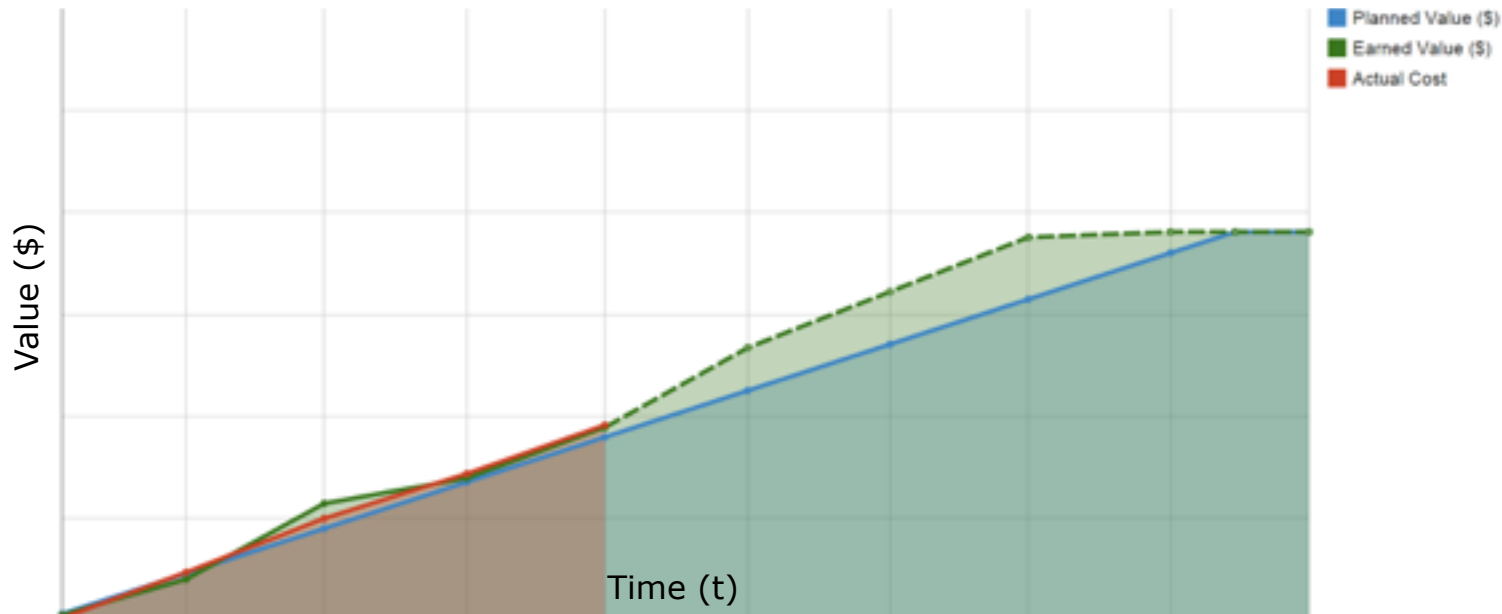
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85	1.15	0.97						
SPI(t)	1.0	1.27	1.03						



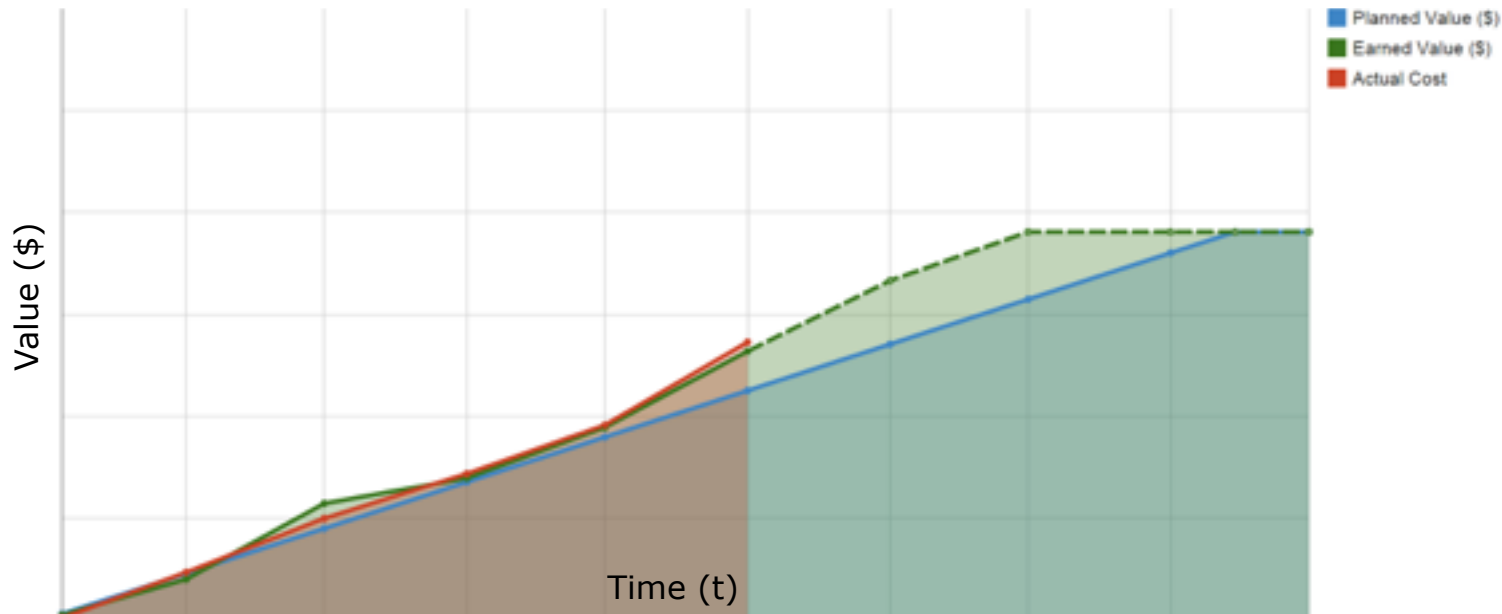
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85	1.15	0.97	0.99					
SPI(t)	1.0	1.27	1.03	1.05					



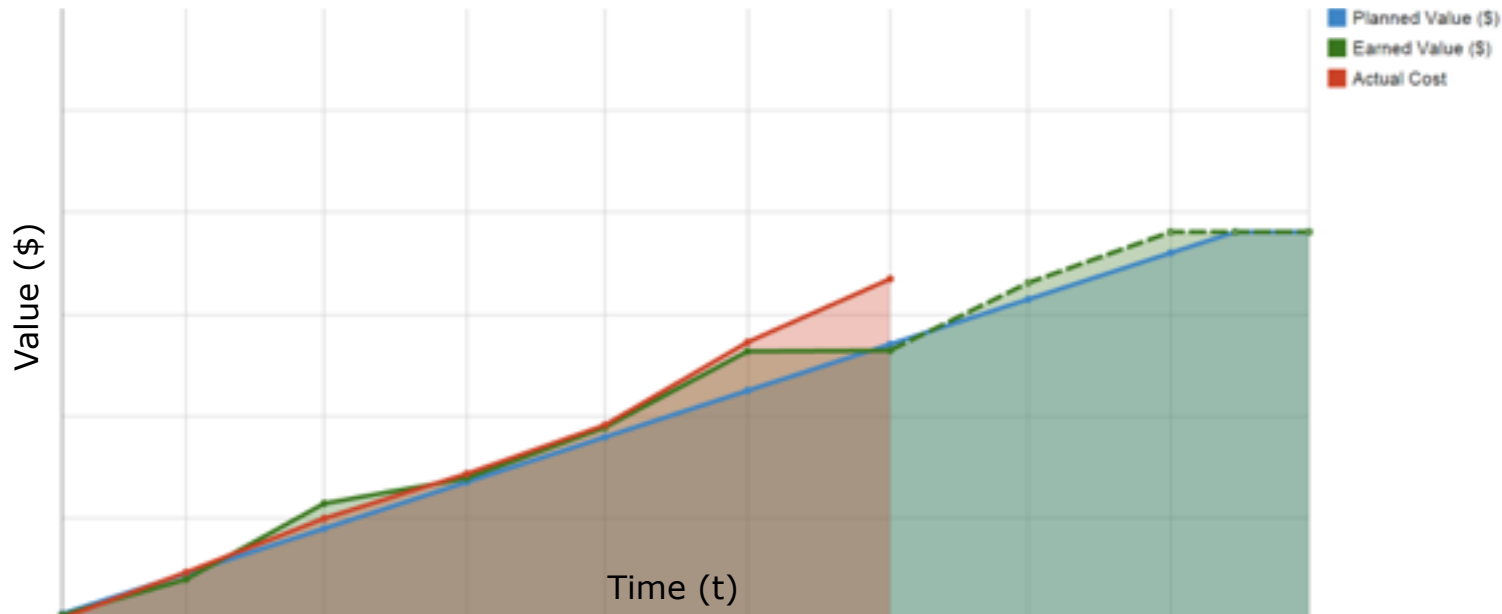
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85	1.15	0.97	0.99	0.97				
SPI(t)	1.0	1.27	1.03	1.05	1.17				



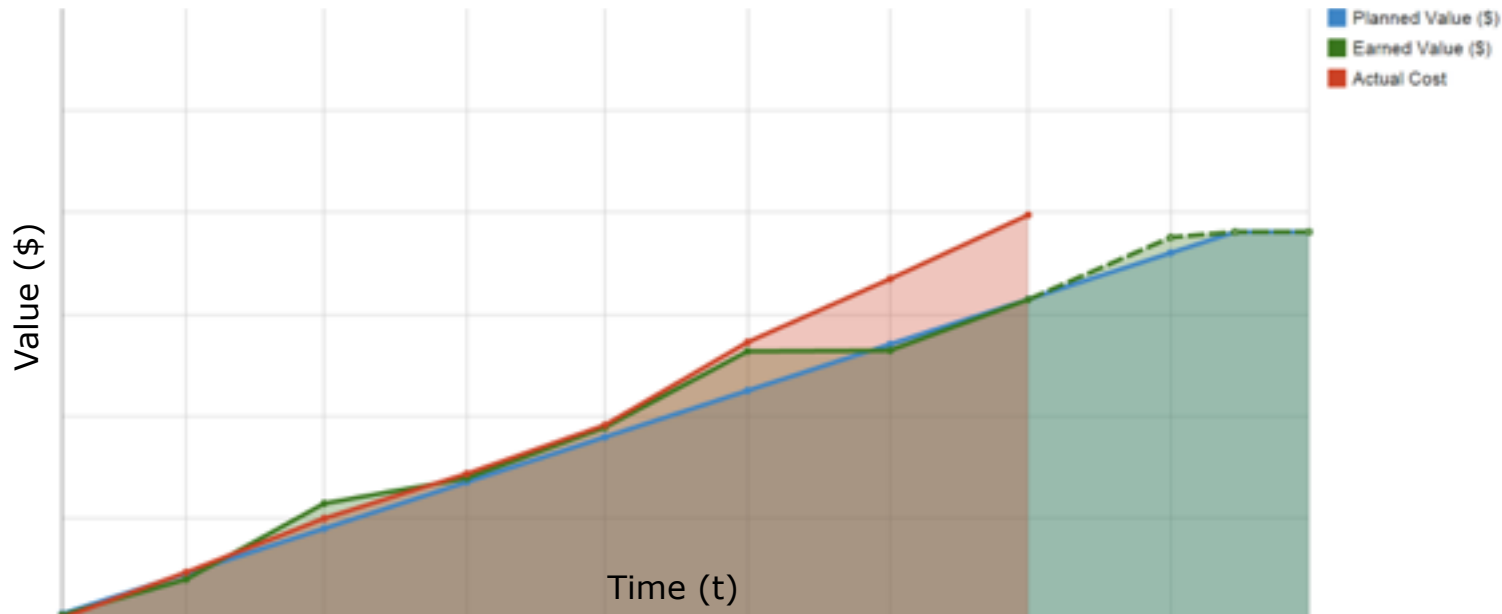
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85	1.15	0.97	0.99	0.97	0.79			
SPI(t)	1.0	1.27	1.03	1.05	1.17	0.98			



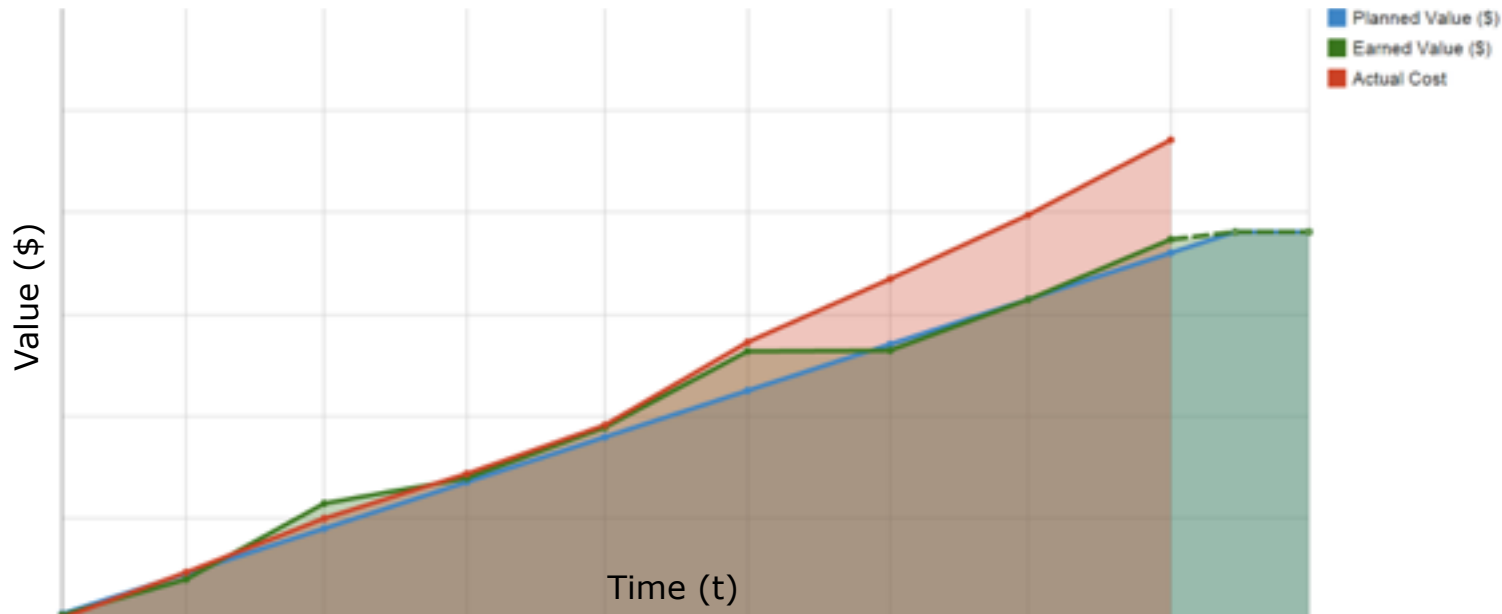
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85	1.15	0.97	0.99	0.97	0.79	0.79		
SPI(t)	1.0	1.27	1.03	1.05	1.17	0.98	1.0		



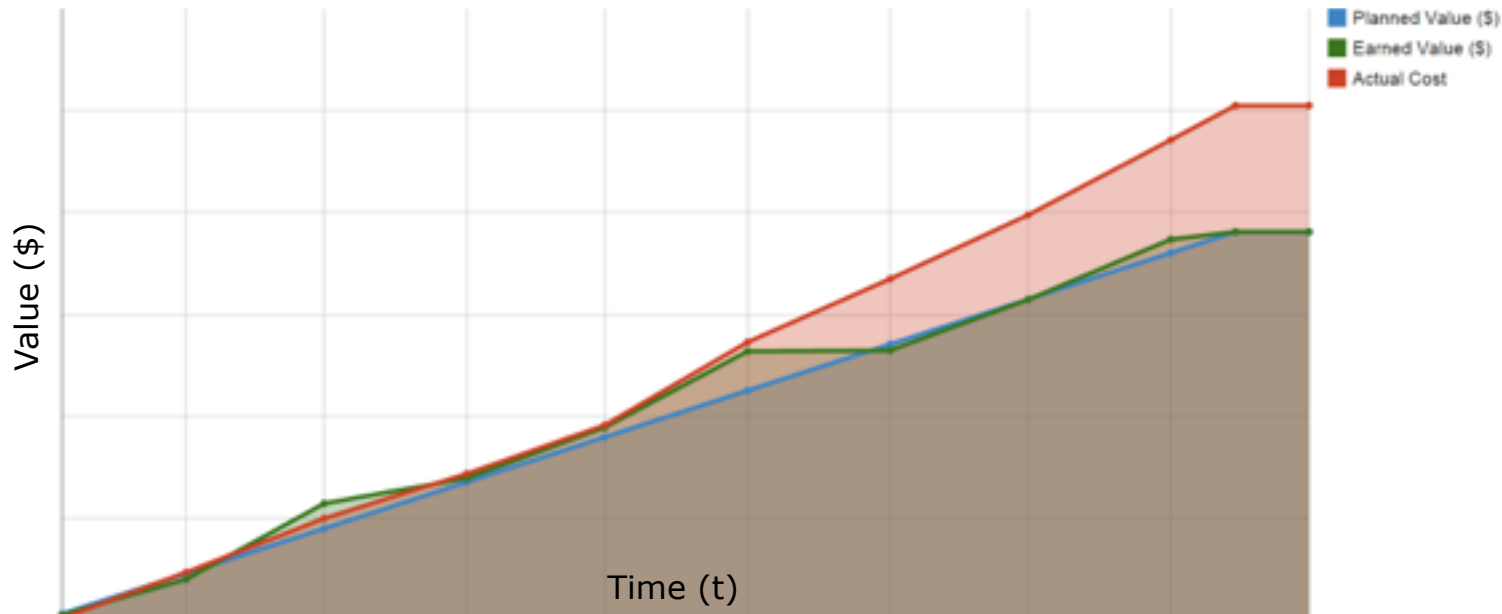
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85	1.15	0.97	0.99	0.97	0.79	0.79	0.75	
SPI(t)	1.0	1.27	1.03	1.05	1.17	0.98	1.0	1.04	



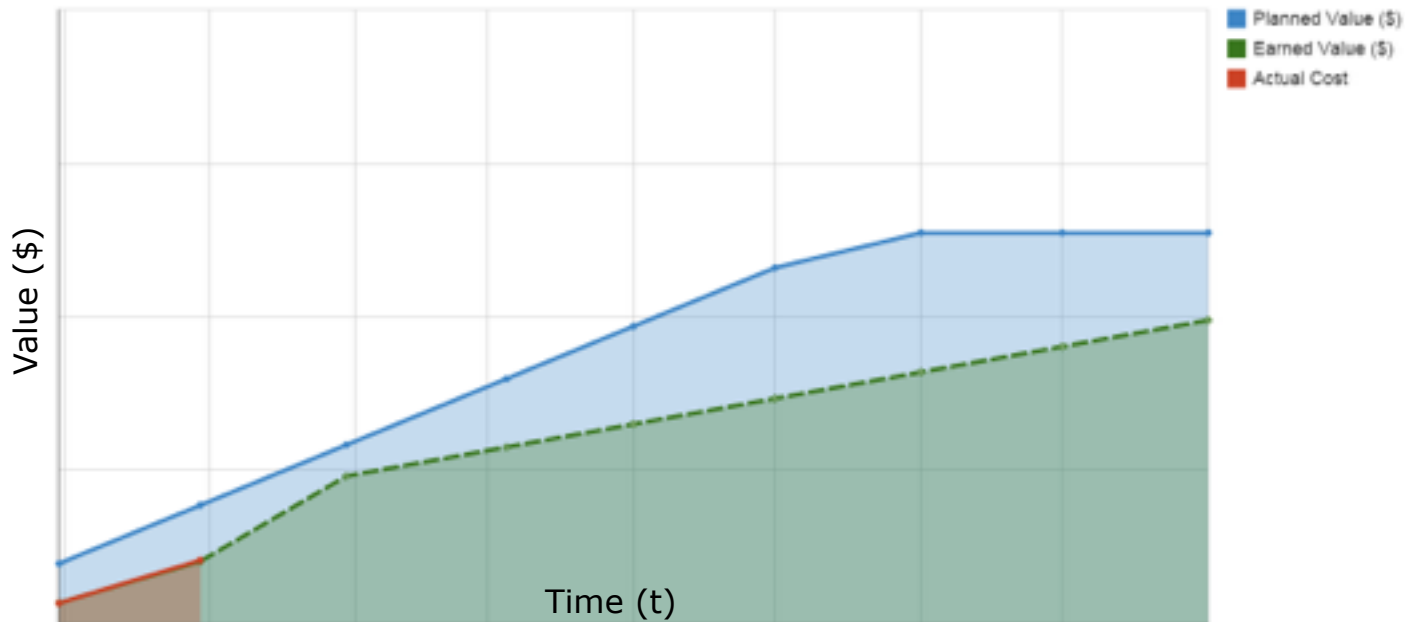
Project Apollo



	M1	M2	M3	M4	M5	M6	M7	M8	M9
CPI	0.85	1.15	0.97	0.99	0.97	0.79	0.79	0.75	0.75
SPI(t)	1.0	1.27	1.03	1.05	1.17	0.98	1.0	1.04	1.0



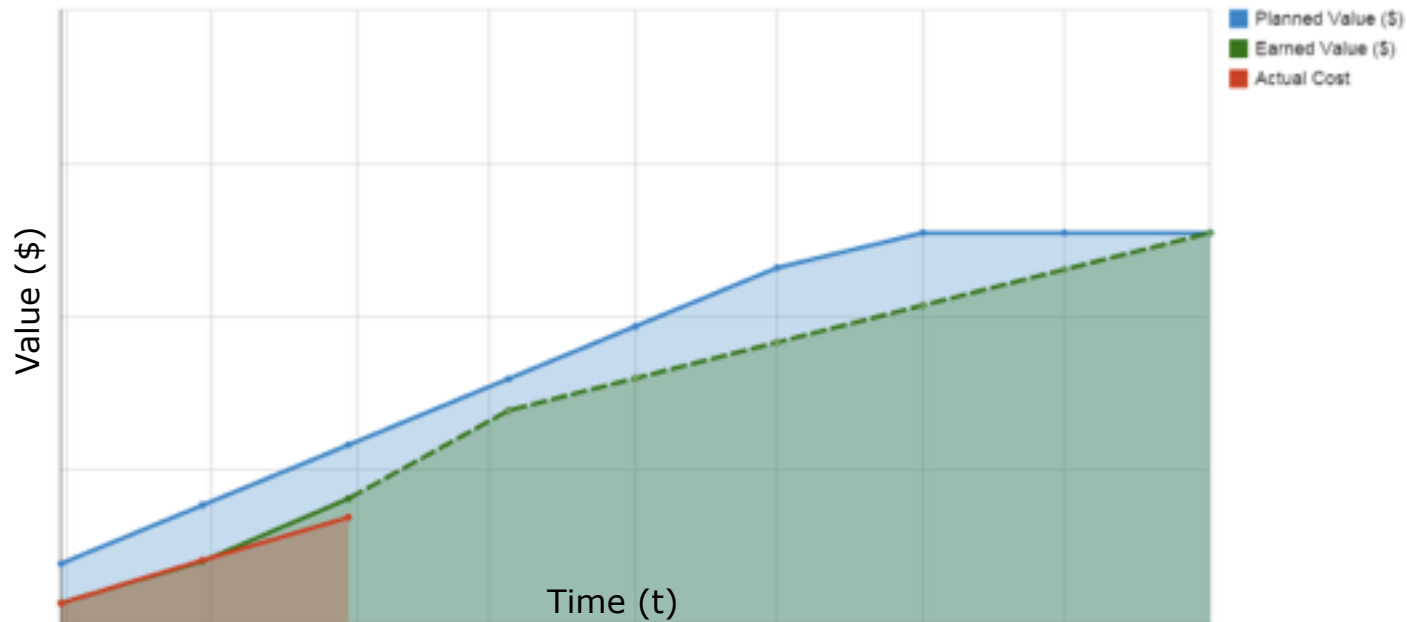
Project Eris



	M1	M2	M3	M4	M5	M6	M7	M8
CPI	0.98							
SPI(t)	0.53							



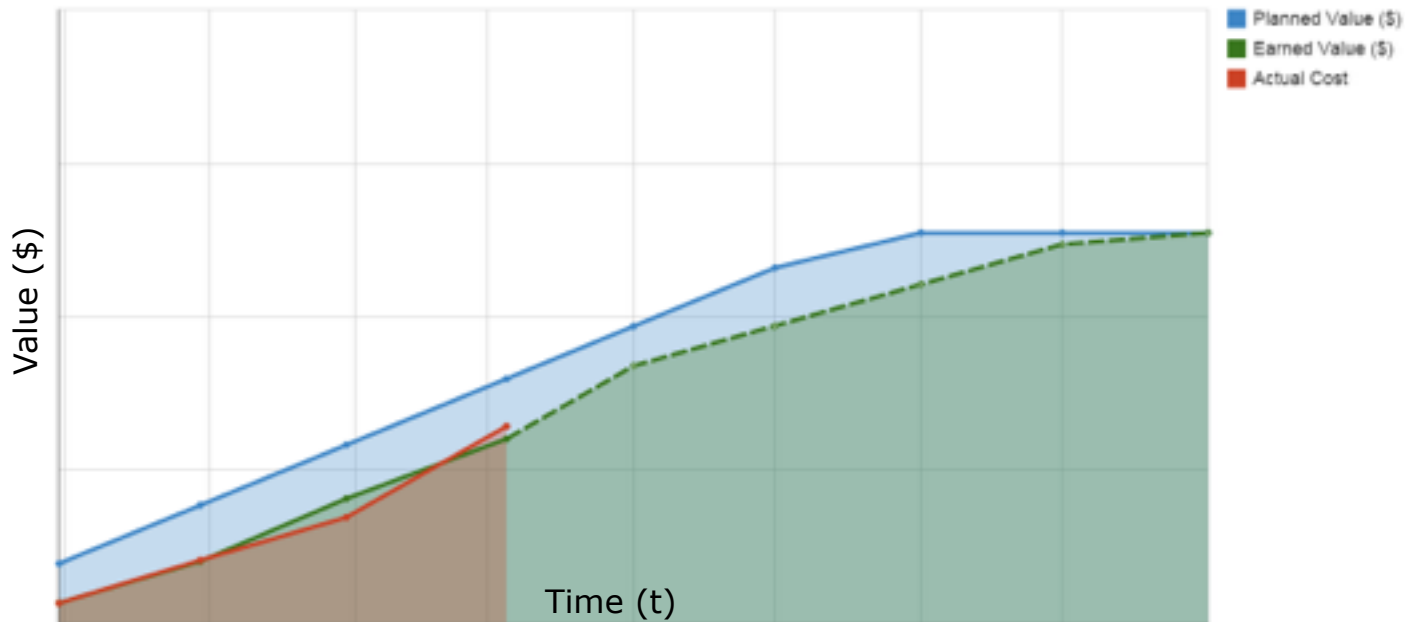
Project Eris



	M1	M2	M3	M4	M5	M6	M7	M8
CPI	0.98	1.18						
SPI(t)	0.53	0.70						



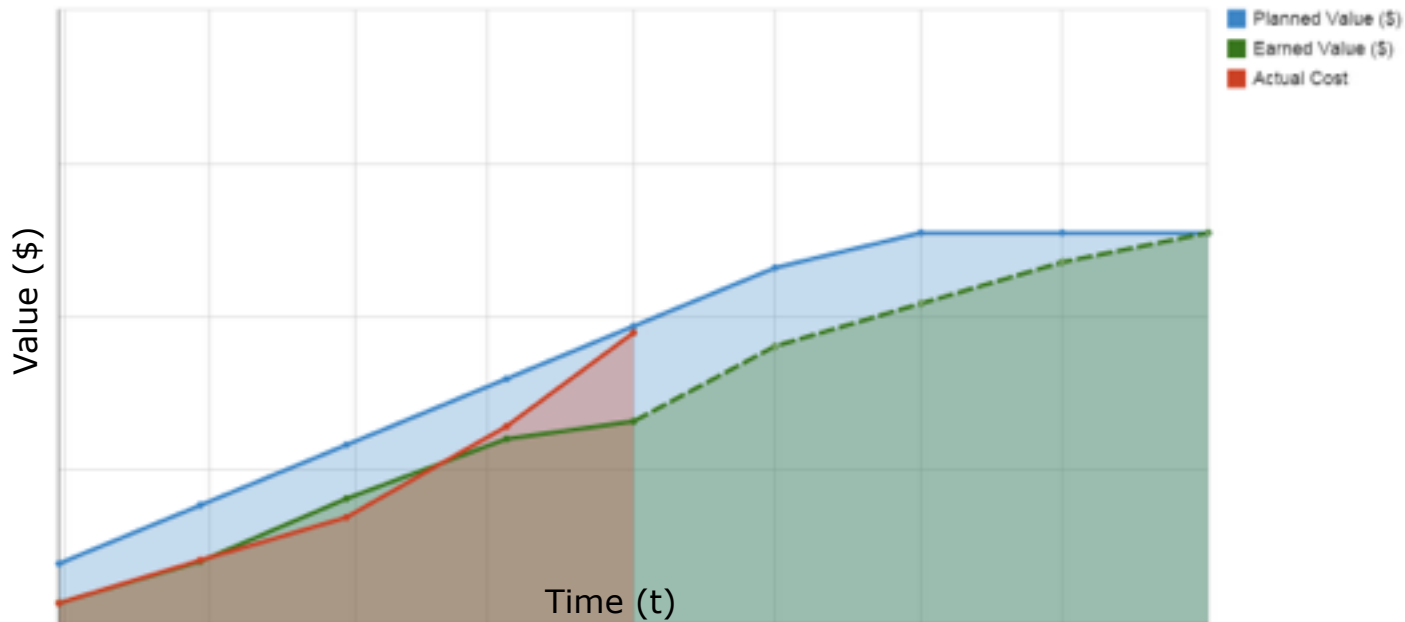
Project Eris



	M1	M2	M3	M4	M5	M6	M7	M8
CPI	0.98	1.18	0.94					
SPI(t)	0.53	0.70	0.75					



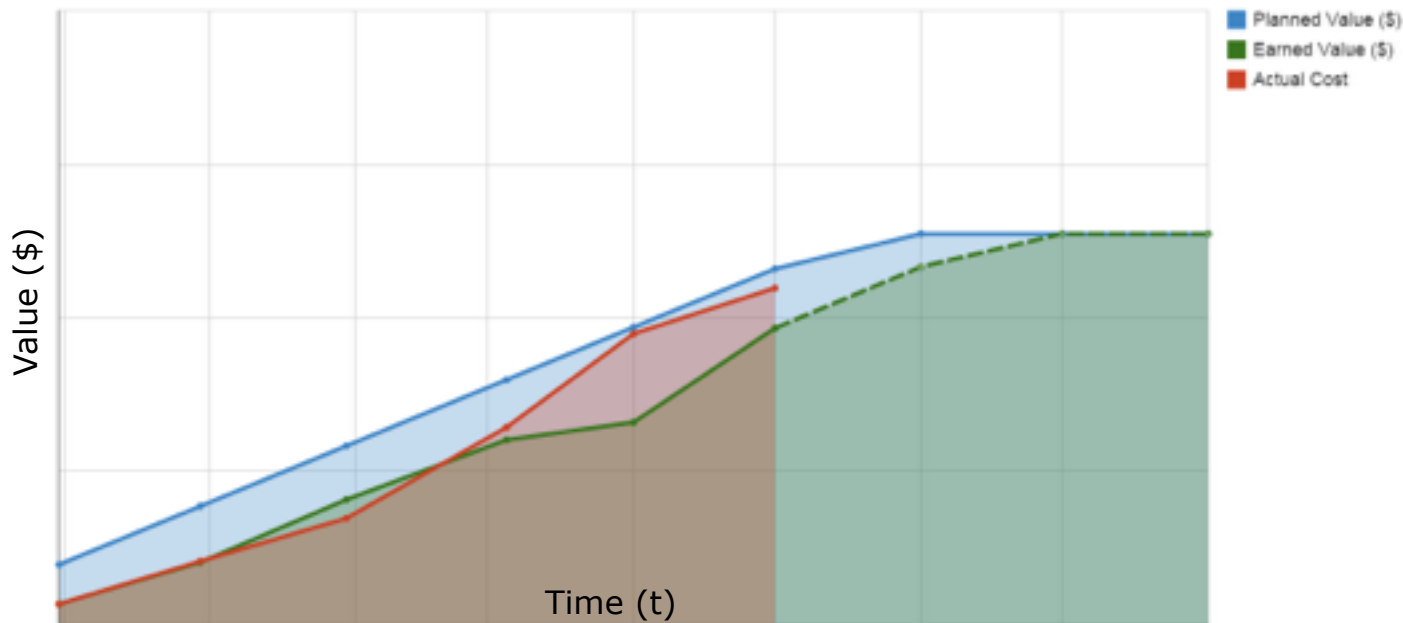
Project Eris



	M1	M2	M3	M4	M5	M6	M7	M8
CPI	0.98	1.18	0.94	0.70				
SPI(t)	0.53	0.70	0.75	0.68				



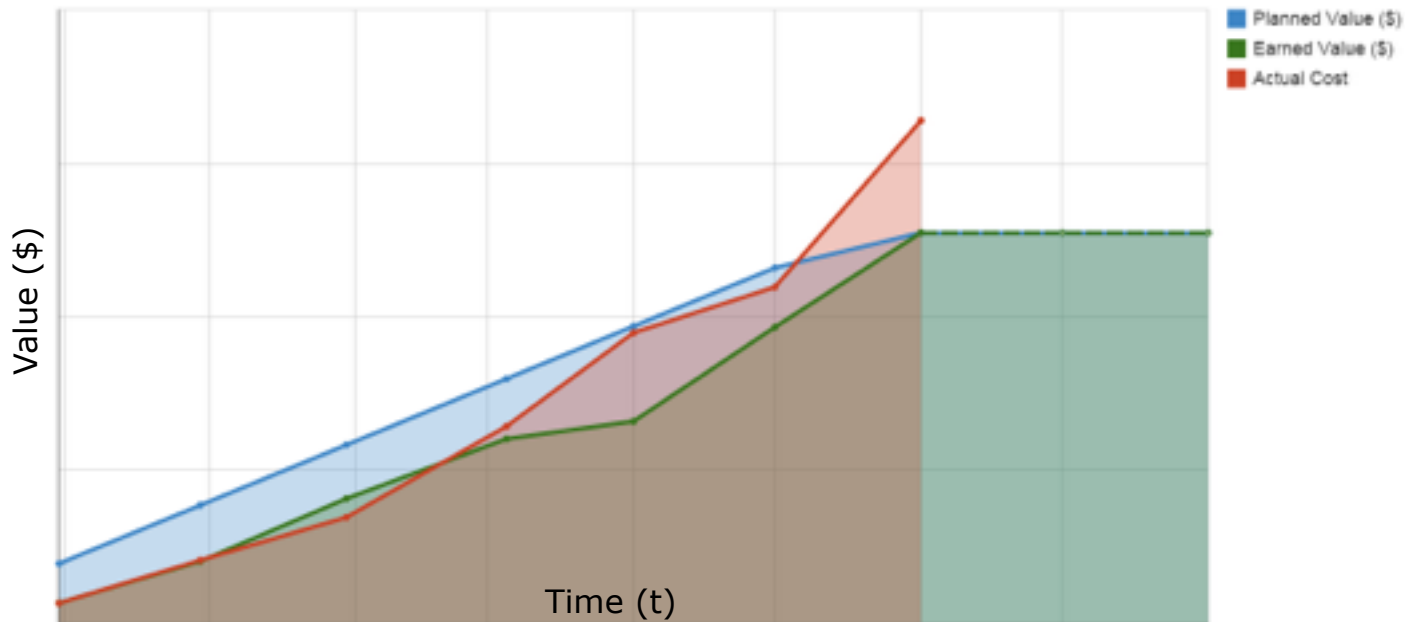
Project Eris



	M1	M2	M3	M4	M5	M6	M7	M8
CPI	0.98	1.18	0.94	0.70	0.88			
SPI(t)	0.53	0.70	0.75	0.68	0.83			



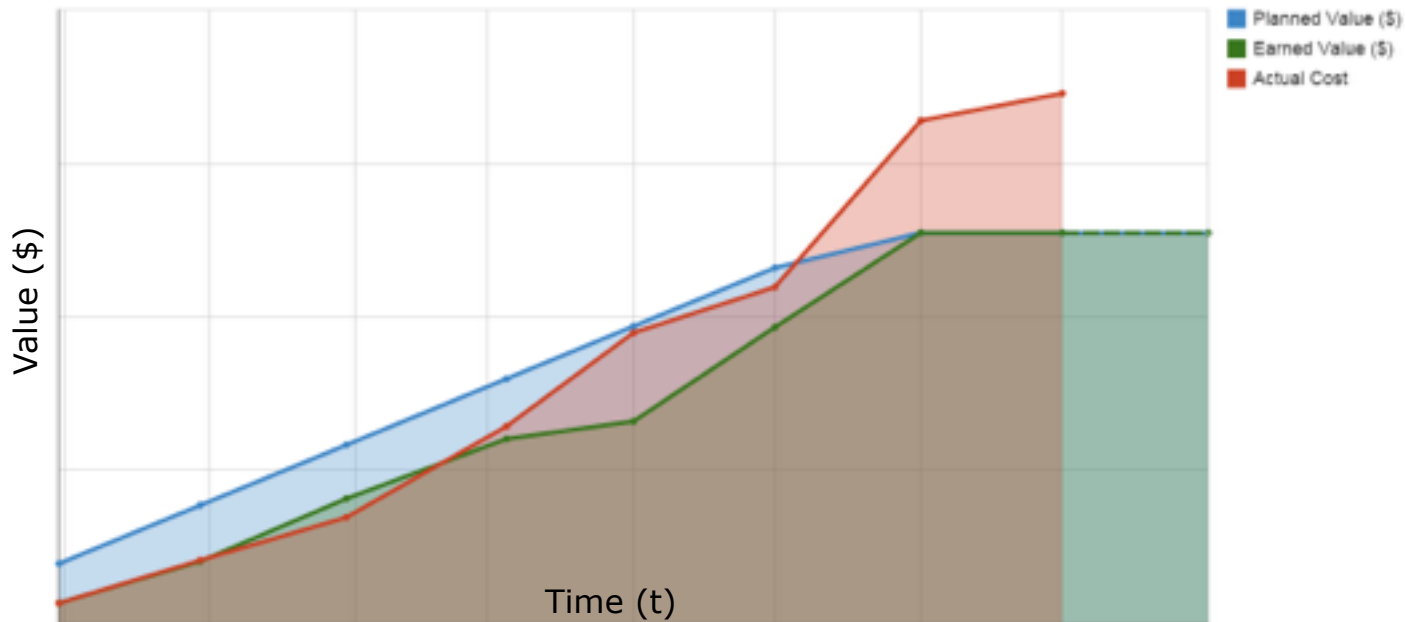
Project Eris



	M1	M2	M3	M4	M5	M6	M7	M8
CPI	0.98	1.18	0.94	0.70	0.88	0.78		
SPI(t)	0.53	0.70	0.75	0.68	0.83	0.94		



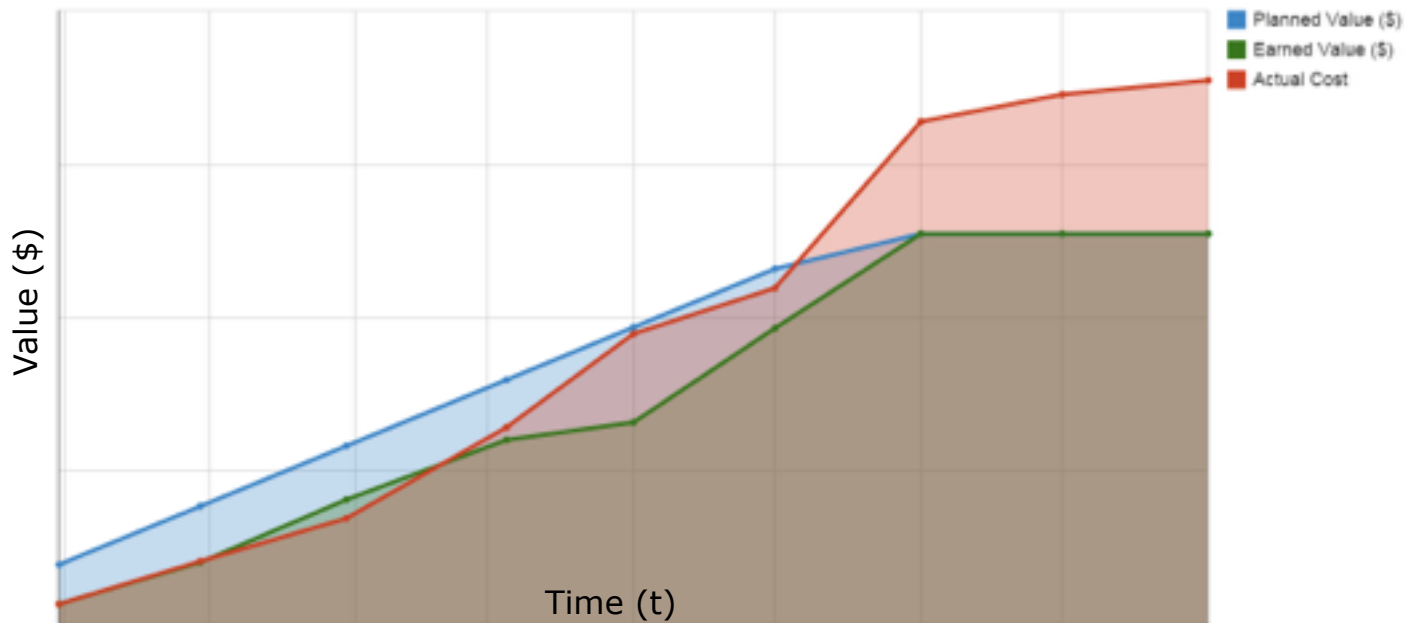
Project Eris



	M1	M2	M3	M4	M5	M6	M7	M8
CPI	0.98	1.18	0.94	0.70	0.88	0.78	0.74	
SPI(t)	0.53	0.70	0.75	0.68	0.83	0.94	1.0*	



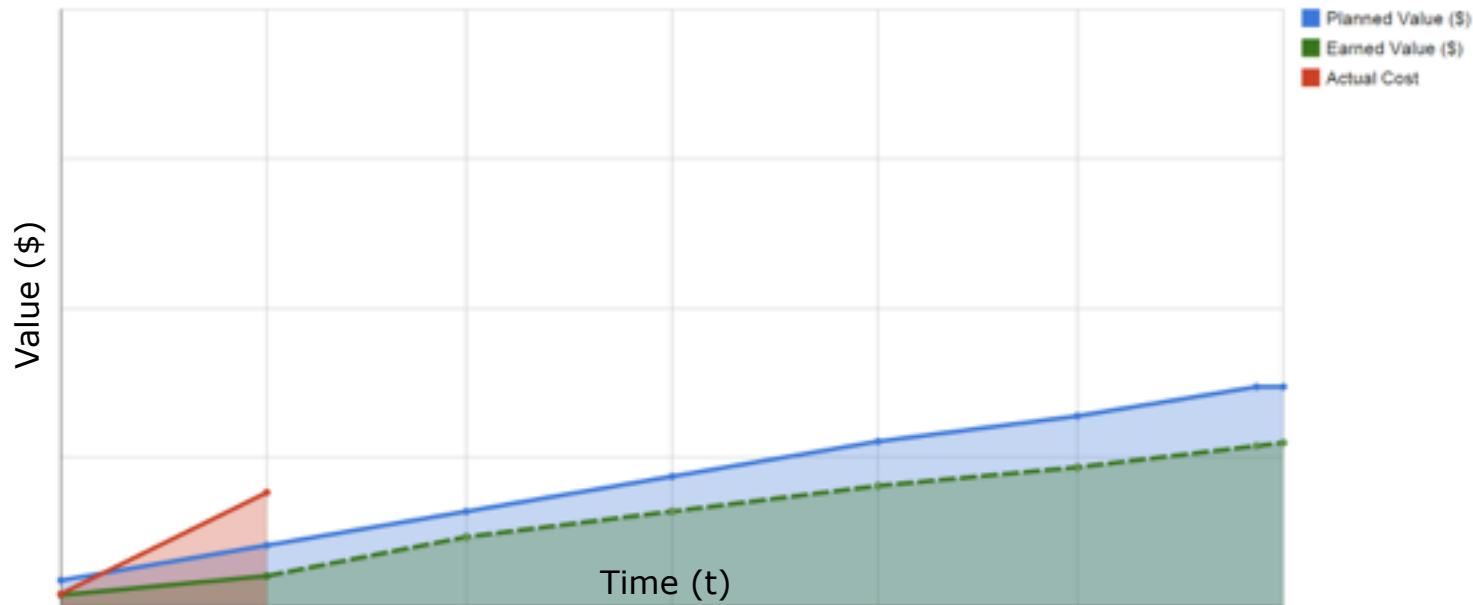
Project Eris



	M1	M2	M3	M4	M5	M6	M7	M8
CPI	0.98	1.18	0.94	0.70	0.88	0.78	0.74	0.72
SPI(t)	0.53	0.70	0.75	0.68	0.83	0.94	1.0*	1.0*



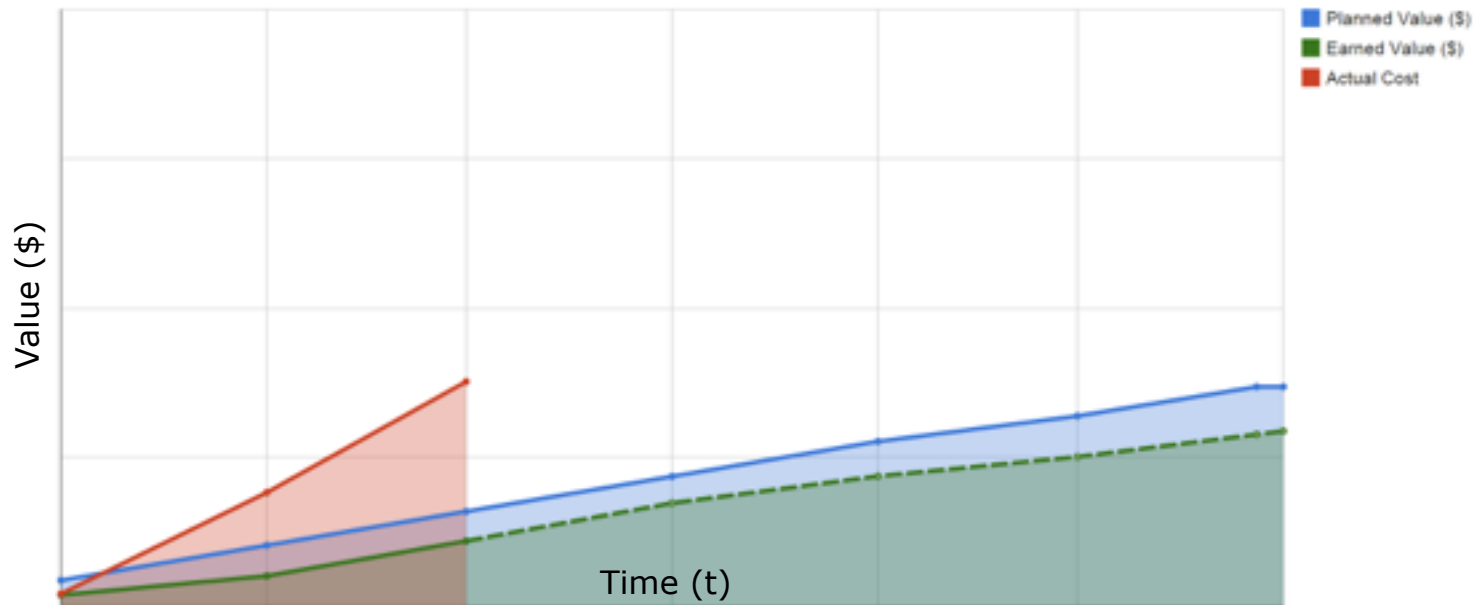
Project Moros



	M1	M2	M3	M4	M5	M6
CPI	0.27					
SPI(t)	0.73					



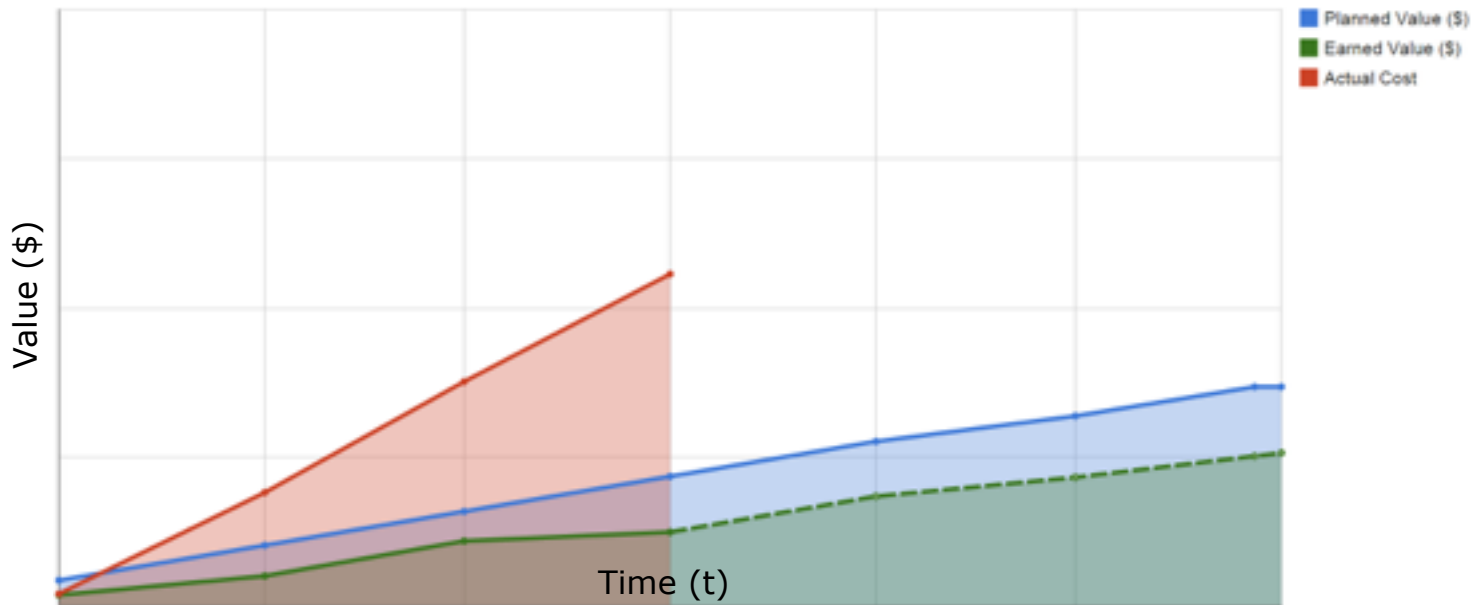
Project Moros



	M1	M2	M3	M4	M5	M6
CPI	0.27	0.29				
SPI(t)	0.73	0.80				



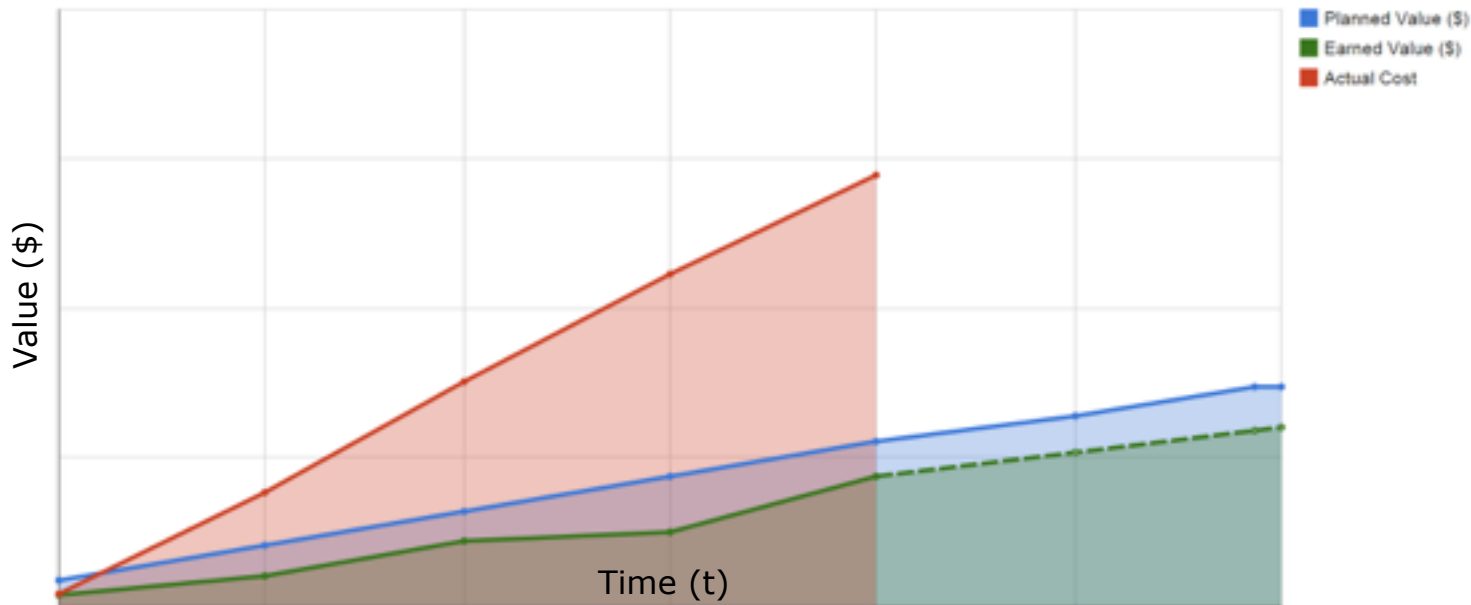
Project Moros



	M1	M2	M3	M4	M5	M6
CPI	0.27	0.29	0.22			
SPI(t)	0.73	0.80	0.65			



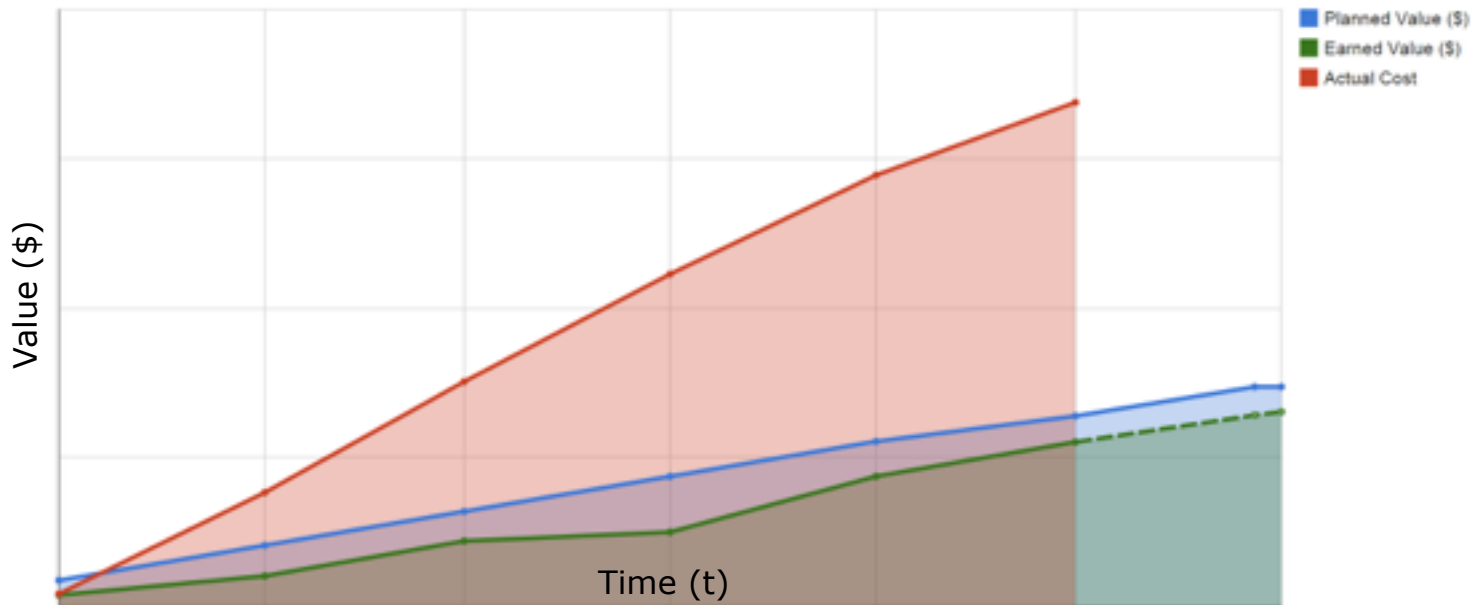
Project Moros



	M1	M2	M3	M4	M5	M6
CPI	0.27	0.29	0.22	0.30		
SPI(t)	0.73	0.80	0.65	0.82		



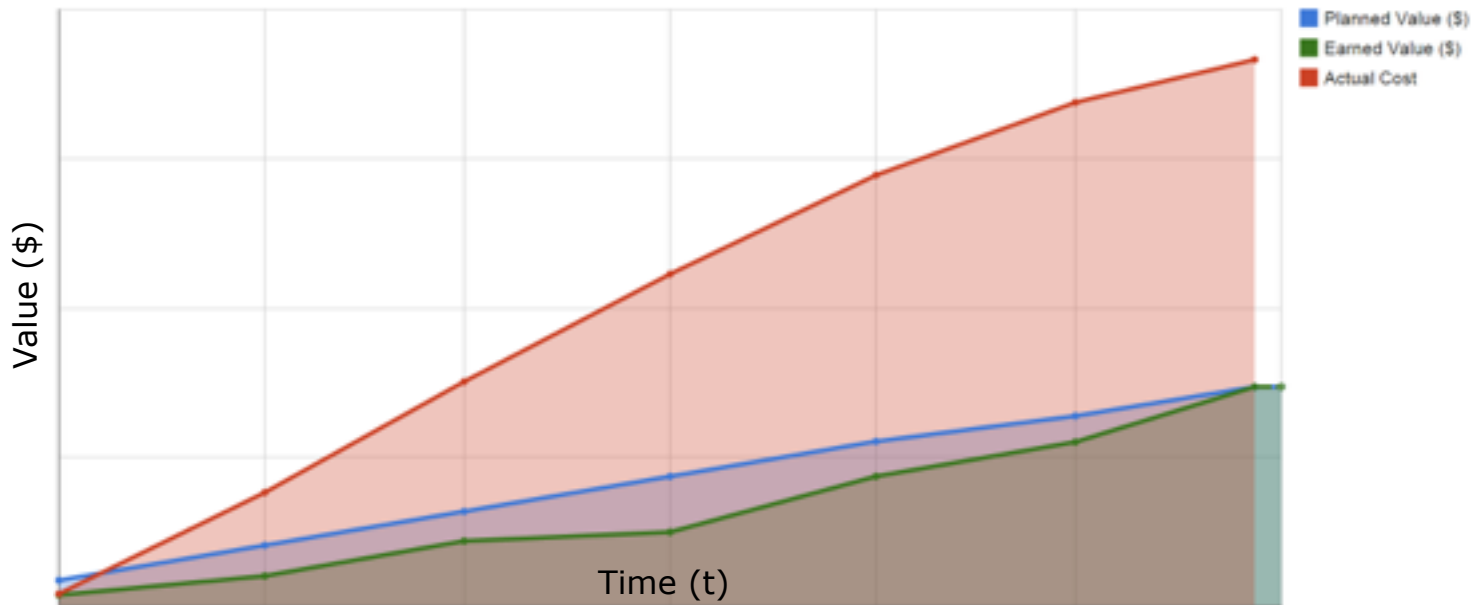
Project Moros



	M1	M2	M3	M4	M5	M6
CPI	0.27	0.29	0.22	0.30	0.33	
SPI(t)	0.73	0.80	0.65	0.82	0.86	



Project Moros



	M1	M2	M3	M4	M5	M6
CPI	0.27	0.29	0.22	0.30	0.33	0.4
SPI(t)	0.73	0.80	0.65	0.82	0.86	1.0*



Course Correction Framework

	SPI < 1	SPI = 1	SPI > 1
CPI < 1	Behind schedule & Over budget. Immediate Response	Under estimated resources. Cut scope or add funds	Ahead in time and over budget. Finish early or decrease resources
CPI = 1	Behind schedule. Extend project or add resources	Stay on target!	Ending early. Move date up or decrease resources.
CPI > 1	Under budget but behind. Add resources to catch up	Over estimated resources. Can add resources to end early	Over estimated. Opportunity cost high, end early or go bigger



Making the Transition





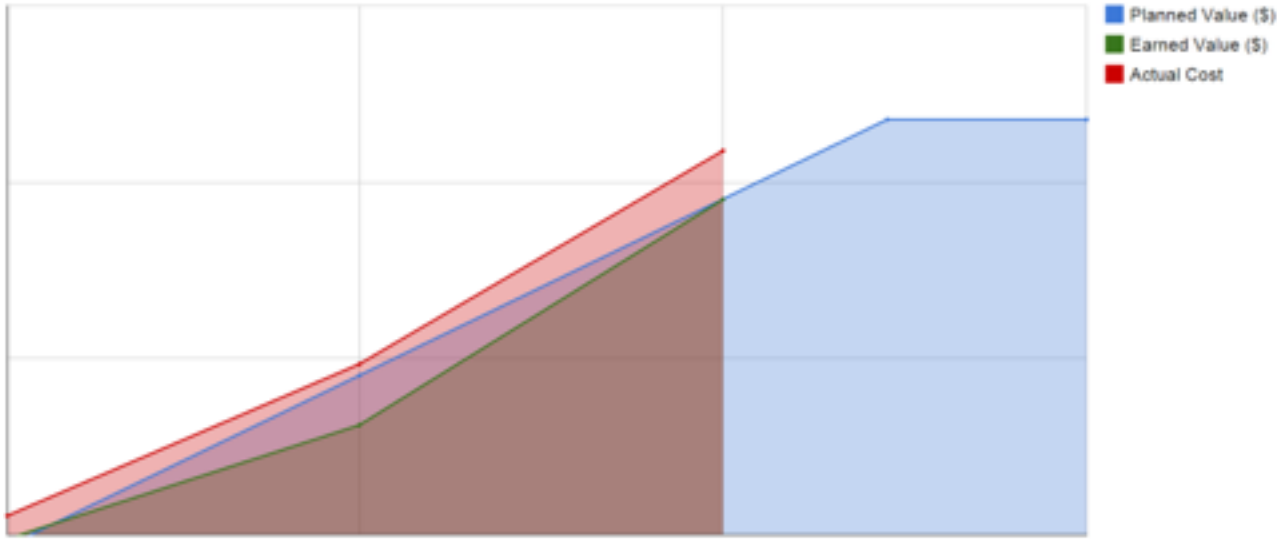
What's Needed

- P&L that provides project cost
- Relatively granular task tracking
 - Need to track scope during development
- Rules for earning value
 - Consistency across projects is helpful
 - Designer sign off after implementation
 - QA team cannot null value, only add potential scope



Project Length and Frequency

- Rule of thumb: 3 months+
- Min frequency should map to sprints





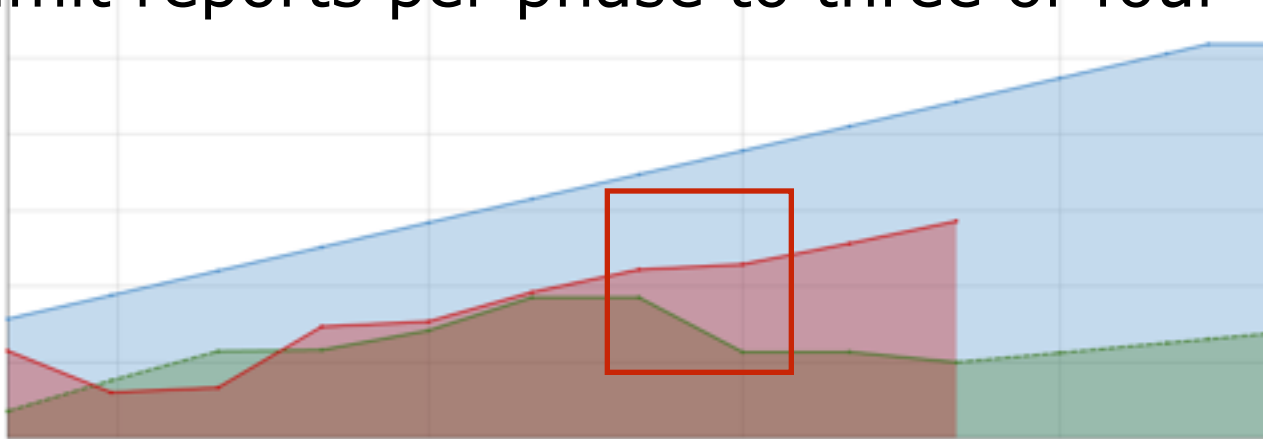
Maintaining EVM

- Need proper planning processes in place
 - Break out labor costs
 - Identifying initial scope
- Setting up new project = 30m-1h
- Updating a project = ~15m
- Review in existing meetings!



Revenue Recognition

- Earned Value can swing wildly
- Break work into phases; claim individually
 - Define type of work in each phase
 - Limit reports per phase to three or four





Conclusion



Earned Value Management

- EVM gives insight into relationship of cost, scope, schedule.
- Useful for projecting project completion
- Provides objective framework for course correction
- Maintaining EVM is easy!



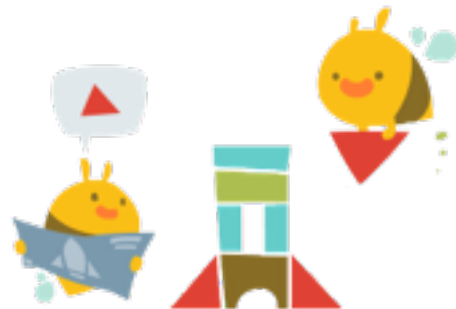
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Filament's Tool - v2.0

- Google Doc Location:
<http://goo.gl/RWkavY>





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